

## Chapter 10

# The Neighborhood Water Stewardship Program: An Innovative Approach to Behavior Change in Northern Virginia

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## Background

Arlington, Virginia is an urban county of about 26 square miles located directly across the Potomac River from Washington D.C. (see Figure 1). Arlington had an estimated population of 198,267 on January 1, 2005, reflecting a 5% increase since 2000. It is among the most densely populated jurisdictions in the country with a population density of about 7,700 persons per square mile—higher than cities such as Seattle, Minneapolis and Pittsburgh. Arlington's population is racially, ethnically and culturally diverse. More than 40% of Arlington's residents are Hispanic/Latino, African- American, Asian or multi-racial. Arlington residents are among the most highly educated in the nation, with over 60% of adults age 25 and older have a bachelor's degree or higher and 30% have a graduate or professional degree.

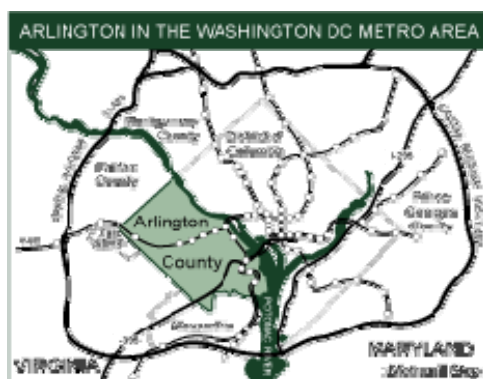


Figure 1. Map of Arlington County in the Washington, D.C. Metro area.

Development in Arlington has significantly impacted the nearly 30 miles of perennial streams in the County. More than half of the County's original stream network has been replaced by a dense network of underground storm sewers. During storms, these storm sewers convey a large volume of runoff and pollutants to streams at high velocities, causing stream bank erosion, water quality problems, and habitat degradation.

Today, Arlington County is a highly urbanized jurisdiction, with 30-40 percent of the County covered by impervious surfaces such as streets, parking lots, and buildings that do not allow rain to soak into the soil. In general, stream degradation begins when imperviousness exceeds 10 percent, and significant deterioration occurs beyond 25 percent imperviousness (Caraco et al., 1998). Urban development and runoff are among the leading causes of water pollution in the U.S., and more than 20 percent of streams and rivers inventoried by states are impaired because of urban runoff and its effects on water quality and stream habitat (US EPA, 1996).

Four Mile Run is the largest stream in Arlington County and drains approximately two-thirds of the County. The 20-square mile watershed includes portions of Arlington and Fairfax counties and the cities of Alexandria

and Falls Church. Lower Four Mile Run was channelized in 1975 following several large floods, and Four Mile Run is listed by the state as a 303d polluted stream. Litter, lawn and garden chemicals, automotive chemicals, and *E. coli* bacteria, as well as sand and sediment, continually degrade the water quality and inhibit aquatic plant and animal life. Many of the watershed's citizens, however, are unaware that water entering storm drains flows untreated into Four Mile Run, the Potomac River, and the Chesapeake Bay.

A Total Maximum Daily Load (TMDL) plan for fecal coliform bacteria has been created for Four Mile Run, with the TMDL Implementation Plan completed in 2002. The Neighborhood Water Steward Team program is an important component of the public education strategy for the three participating localities to meet Municipal Separate Storm Sewer System (MS4), Tributary Strategy, and TMDL public education requirements. In addition, federal funding has been appropriated for a Four Mile Run Restoration Master Plan project, to study the flood channel portion of Four Mile Run and create a plan for improving this portion of the stream. Partners on the restoration project include Arlington County, the City of Alexandria, the Army Corps of Engineers, and the Northern Virginia Regional Commission.

## Program Development

A major challenge to improving water quality in streams is getting residents to change behaviors that contribute to nonpoint source (NPS), or stormwater runoff, pollution. The Neighborhood Water Steward Team Program goes beyond many NPS education programs to help residents learn new behaviors that prevent water pollution. The program is a partnership of a non-profit organization Arlingtonians for a Clean Environment, Arlington County, the City of Falls Church, and the City of Alexandria. To become water stewards, volunteer team leaders create neighborhood-based teams that learn about preventing water pollution. The program is derived



*A Water Steward team in Falls Church, VA holds a meeting.*

from the Empowerment Institute's "Ecoteam" program, and was created in partnership with the Empowerment Institute with the use of grant funding from the National Fish and Wildlife Foundation.

The Water Stewardship Program is unique among NPS education programs for several reasons. This program goes beyond simply educating residents about preventing NPS pollution and helps them learn new behaviors to protect

water quality and conserve water. Participants in the program complete a "before" and "after" assessment, so the program managers can track which new behaviors team members have adopted. A trained coach works with each team, leading some of the team meetings, which helps ensure success of the teams. The

neighborhood participation component is also a unique way to attract some team members who may not be interested in environmental issues.

The underlying theory that is the basis for this program is social diffusion research, as described by Everett M. Rogers (*Diffusion of Innovations*, 1995). Rogers studied many types of innovations and how they spread throughout society. He found that people vary in their openness to new concepts or technology. Approximately 15% of the population are innovators or early adopters, and will quickly adopt innovations. Following the innovators and early adopters is the early majority (34%), the late majority (34%) and the laggards (16%), who many never adopt the innovation. Rogers also found that innovations that will succeed in society become unstoppable after reaching the early adopters, or 15-20% of population.

This information is useful to those doing NPS and environmental education, as it shows it is not necessary to reach 100% of the population. Behaviors that prevent NPS pollution may spread throughout the population once they are adopted by the early adopters, or approximately 15% of the population.

The three key points that are used to market the Water Steward Team program to team leaders and their neighbors are:

1. Get to know your neighbors better and build community;
2. Improve local water quality in streams;
3. Improve the neighborhood.

## Program Overview

In 2003 and 2004, the Water Stewardship Program and materials were tested. In the program model, trained team leaders invite neighbors to take part in the program, creating a team of five to eight households. The team members participate in five meetings over three months. These meetings are:

- Neighborhood Gathering,
- Team Building Meeting,
- Water Quality Meeting,
- Water Conservation Meeting, and
- Helping Out meeting.

With the help of a step-by-step workbook and trained volunteer coach, the teams choose from a series of practical actions to reduce NPS and improve water quality. The actions are written in a simple format and designed not to overwhelm participants, even someone very new to the concepts. There are three categories of actions: actions to protect water quality, actions to conserve water, and actions to increase community involvement. Sample actions include cleaning up after your dog, fixing oil leaks on your vehicle, reducing use of fertilizers/pesticides on your yard or garden, creating a rain garden, and reducing paved surfaces around your home. Each team member generally completes six to ten actions by the end of the program. To date, we have established 25 neighborhood-based teams that are implementing watershed-friendly lifestyle actions.

A critical component of the program is information tracking. Team members complete a “before” and “after” assessment form, which allows program managers to track which actions team members have adopted and calculate the environmental benefits of those actions. Following the program, each team member receives a personalized report for their household showing the benefits resulting from the actions they adopted.

Currently, program partners are conducting three team leader trainings each year, for ten team leaders per training. The majority of teams have been neighborhood-based, but some teams have been at-large or organized through a community group or church. In 2005, program partners conducted a “coach” training, training six former team leaders to become coaches for new team leaders. The training of new coaches for the program will enable the expansion of the program in future years.

Program partners have developed a strategy to continue to expand the Water Steward Team program with the eventual goal of creating 1,400 Water Steward Teams, approximately 15% of the population. The Neighborhood Water Steward Team program is an important component of the education strategy for the three localities to meet MS4, Tributary Strategy, and TMDL public education requirements.



Figure 2. Volunteers attend a Water Stewardship Team Leader training in Arlington, VA.

## Program Results

To date, 45 team leaders have completed the Water Stewardship Program training, and have led 25 teams through the program (or approximately 125 households). Each household on average adopts 6 - 8 new actions, resulting in a total of 581 separate actions to protect water quality or conserve water. These actions have resulted in an annual savings of over 1,800,000 gallons of water.

Nationwide results with the original Ecoteam program show household recruitment rate ranging from 20-30%. From the first two years of the program in Northern Virginia, the recruitment rate has been 44%. In 2004, 296 households were invited to participate in the Water Stewardship Program. Of those invited, 44% attended the neighborhood gathering to find out more about the program. Of those households attending the gathering, 81% joined the team, or approximately 100 households.

In 2004 and 2005, the top ten actions that were adopted by Water Stewardship Team members are shown in Table 1. Table 2 summarizes all the actions taken by Water Stewardship Team members in 2004-2005.

Action	Number of Households
1. Toxic Sleuth	35
2. Scrub-A-Dub Rub	34
3. Scrub-A-Dub Tub	33
4. Aqua Cop	32
5. Am I Clean Yet?	25
6. Go With the Flow	25
7. A No Rainer	22
8. A Master Waterer	21
9. The Road Less Traveled	20
10. Catch it While you Can	18

Table 1. Top Ten Actions adopted by members of Water Stewardship teams in 2004-2005.

<b>Action</b>	<b>Number of Households Who Completed Action</b>	<b>Percentage of Households Who Completed Action</b>
<b>Toxic Sleuth</b> - Replace household chemicals with environmentally friendly products	35	56%
<b>Poop Scoop</b> - Cleaning up after your dog	3	5%
<b>Don't Be an Oil Drip</b> - Identifying and fixing oil leaks on you vehicle	8	13%
<b>No Phos-for-Us</b> - Washing your car with the least environmental impact	11	18%
<b>A Natural Lawn</b> - Reducing your use of weed killers and fertilizers on you lawn	14	23%
<b>A Green Gardener</b> - Reducing your use of toxic pesticides, herbicides, and fertilizers on your garden	20	32%
<b>Cut it High and Let it Lie</b> - Mulching grass	8	13%
<b>Let it Rot</b> - Backyard Composting	16	26%
<b>Down by the Stream</b> - Creating a Streamside "Grow Zone"	2	3%
<b>A No Rainer</b> - installing a rain barrel or downspout extensions	22	35%
<b>Catch it While you Can</b> - Creating a Rain Garden	18	29%
<b>Yard Makeover</b> - Creating a water-friendly landscape	21	34%
<b>Let the Ground Show Through</b> - Reducing paved surfaces	10	16%
<b>The Road Less Traveled</b> - Reducing vehicle miles traveled	20	32%
<b>Aqua Cop</b> - Find and fix water leaks in your home	32	52%
<b>Aqua Tech</b> - Install water saving devices	14	23%
<b>Scrub-A-Dub-Rub</b> - Reducing water used in personal care	34	55%
<b>Scrub-A-Dub Tub</b> - Reducing water used to wash dishes	33	53%
<b>All Bottled Up</b> - Drinking refrigerated water	10	16%
<b>Tanks A Lot</b> - Reducing water used for flushing toilets	17	27%
<b>Am I Clean Yet?</b> - Reducing water used for showers and baths	25	40%
<b>Go With the Flow</b> - Reduce number of toilet flushes	25	40%
<b>Lawn Ranger</b> - Reducing water used for lawns	13	21%
<b>A Master Waterer</b> - Reducing water used for gardening	21	34%

*Table 2. Frequency of actions taken by Water Stewardship Team members in 2004-2005.*

## Community Campaign

Water Stewardship Program partners have developed a plan for expanding the Water Stewardship Team program to 15% of the population in the Four Mile Run watershed over the next ten years. This would require completing 1,425 teams based on the population in the Four Mile Run watershed. Table 3 shows the number of teams needed per year to complete 1425 teams by the year 2013.

In 2005, with the assistance of a volunteer specializing in marketing for nonprofits, a draft marketing plan was completed for the Water Stewardship Program. This plan has helped program managers organize the long term goals for the program and select some strategies to focus on in 2005 in support of these goals. The goals selected as priorities for 2005 include:

- Raising funds from local businesses;
- Raising funds through grants;
- Bolster awareness and support among the 60 civic associations in Arlington;
- Solidifying the brand image of the program.

Year	Number of Teams	Cumulative Number of Teams
2003	5	5
2004	20	25
2005	20	45
2006	60	105
2007	60	165
2008	60	225
2009	200	425
2010	200	625
2011	200	825
2012	200	1025
2013	400	1425

*Table 3. Number of teams needed per year to complete 1425 teams by 2013.*

## Conclusions

The Neighborhood Water Steward Team program is an important component of the education strategy for the three localities to meet MS4, Tributary Strategy, and TMDL public education requirements. Initial results from the first twenty five teams to complete the program demonstrate that the Water Stewardship Team program effectively helps people learn and adopt new behaviors that improve water quality, conserve water, and improve their community.

Households participating in the program to date have adopted 581 new actions, such as installing rain barrels, cisterns, rain gardens, reducing pesticide and fertilizer use, and checking vehicles for fuel leaks. More importantly, new relationships are formed and community bonds are strengthened after people complete the program, resulting in other initiatives in the community. One former team leader has galvanized his community to complete native planting projects, and has organized six large native plant sales in his

neighborhood. Members of another team are working with the building and grounds committee at their condominium complex to revise the landscaping contract, and have installed two rain gardens and four rain barrels in the complex. A community in Boulder, CO has adapted the Water Steward Team program for their area as well.

The Water Stewardship Program will be growing to reach 15% of the population over the next 13 years, creating a network of neighborhoods committed to watershed protection through household actions. Through continued neighborhood meetings, online discussions, and workshops, this network will provide leadership for community improvement efforts and also provide an outstanding base for local watershed improvements by government, local community organizations, and residents.

## Program Partners

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