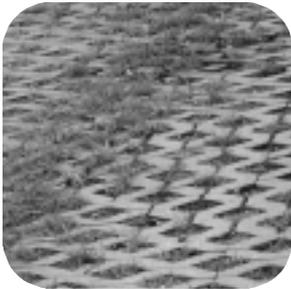




Five Environmental Goals for the City of Falls Church



A Progress Report for 2015



*by the
Village Preservation & Improvement Society
and the
Environmental Services Council*

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Introduction

The City of Falls Church has a long history of forward-looking environmental programs and policies. The City is recognized as a local leader in the implementation of strong and effective programs for a sustainable environment.

In 2009, the Falls Church Village Preservation and Improvement Society (VPIS) developed a report titled Five Environmental Goals for Falls Church¹ identifying key aspects of the local environment and describing long-term goals for improvement. This 2015 progress report reviews progress made in each of these areas and updates the long-term goals.

This report is a joint effort by VPIS and the City of Falls Church Environmental Services Council (ESC). The ESC is established by the City and provides advice on a wide range of City environmental matters. VPIS is a local non-profit organization that supports cultural, historical, and environmental programs in the City.

Today, as in 2009, the quality of the environment in the City of Falls Church is at risk from elements as diverse as rapid and increased development and a changing climate. The five broad goals for environmental improvement identified in 2009 remain important:

- u increase tree canopy;
- u increase residential solid waste recycling;
- u reduce the release of greenhouse gases causing global warming;
- u increase green or “pervious” surfaces; and
- u promote sustainable building standards.

Over the past five years, the City has made varying degrees of progress in the five key environmental areas described in the 2009 report. VPIS and the ESC find that:

- u progress in one of the five areas (solid waste recycling) has been substantial (HHH);
- u progress in three of the areas (tree canopy, green surfaces, and building standards) has been moderate (HH); and
- u progress in one area (greenhouse gases) has been limited (H).

These five goals for strengthening environmental sustainability are described in more detail in this Progress Report. Based on the progress made in each case, VPIS and ESC have identified and updated long-term goals or targets. Steps that the City should take to move toward these long-term goals are also summarized.

Attaining these five key environmental sustainability goals is essential to the long-term health of the environment in the City. Meeting these goals will also demonstrate to neighboring communities that Falls

Church is doing its part to meet the environmental challenges the region faces and is implementing a comprehensive and meaningful set of environmental policies and programs. At the same time, these goals are attainable and affordable and are scaled to the resources and capabilities of the City.

The ESC and VPIS will promote both the adoption of these goals and the implementation of policies and programs needed to assure their attainment. It is the intention of both organizations to monitor progress in these areas over time and provide periodic progress reports similar to this report. In order to maintain its position of leadership in addressing serious environmental problems, VPIS and the ESC encourage the City of Falls Church to renew its commitment to strong environmental programs and make a concerted effort to continue and expand environmental protection efforts in these five key areas.

Finally, it is important to recognize that these five goals are mutually reinforcing and, taken together, form a fabric of protection for the environment. For example, increasing tree canopy helps protect water quality by reducing storm water runoff and erosion but also helps reduce emission of greenhouse gases that cause global warming. Reducing impervious surfaces helps make a more robust tree canopy possible while protecting water quality. LEED designed buildings use less energy and thus reduce greenhouse gas emissions. Increasing recycling rates reduces litter and reduces greenhouse gases because recycled products require less energy to make than products that do not use recycled material.

Assessment of Progress on 5 Goals	
2009 through 2014 – on a scale of 1 to 3	
1 - Increase Tree Canopy	HH
2 - Increase Residential Recycling	HHH
3 - Reduce Greenhouse Gases	H
4 - Increase Green Surfaces	HH
5 - Promote Building Standards	HH

1) Increase Tree Canopy

GOAL Increase the percentage of the land area of the City that is covered by tree canopy by protecting mature shade trees and planting new ones.

2012 Estimate	35% tree canopy
Interim Goal	40% tree canopy or 5% increase by 2025
Long-term goal	45% tree canopy or 10% increase by 2037



The City of Falls Church is known for its commitment to diverse and healthy trees. The City of Falls Church has been designated as a “Tree City, USA” by the National Arbor Day Foundation for 35 consecutive years (since 1980) as verified by the Virginia Department of Forestry. The City Tree Commission and VPIS in concert with the City Arborist, actively pursue protection of the urban forest throughout the City. With VPIS, the City supports the Neighborhood Tree Program (NTP) which has planted a total of 840 trees between 2000 and 2014.

A 2012 study by the Virginia Polytechnic Institute reported tree canopy in Falls Church at 35%ⁱⁱ. This is an improvement over estimates of tree canopy from 1990 (28%) and 2001 (25%). A recent report by the University of Vermontⁱⁱⁱ looking at Fairfax County and the surrounding area, however, estimated tree canopy in the City to be 45%. Each of these studies used different methods, making comparison among studies over time problematic. Given this uncertainty, the progress toward the general goal of increasing tree canopy is best described as moderate.

The lack of reliable data also complicates setting numerical goals for improving tree canopy. Neighboring jurisdictions have, however, overcome data uncertainty and set targets. The District of Columbia has adopted a 40% tree canopy goal^{iv} while Fairfax County has adopted a goal of increasing its 41% tree canopy to 45% by 2037^v. A tree canopy in the 40% range is considered necessary for a healthy watershed in a suburban area like Falls Church^{vi}. Given these benchmarks, the City should make 40% tree canopy an interim goal (i.e.; by 2025) and 45% a longer term goal (i.e.; by 2037). Recognizing the uncertainty concerning current tree canopy estimates, however, this target should also be expressed as a percent increase (i.e.; 5% increase by 2025 and 10% by 2037) and be revised as more reliable information is developed.

The small geographic area of Falls Church (i.e.; 1,313 acres)

makes meeting these targets for increased canopy more challenging for the City than for larger jurisdictions with more diverse land use. The report by the University of Vermont found that, in addition to the existing tree canopy in Falls Church, an additional 33%^{vii} of the City could potentially be converted to tree canopy (about 400 acres) about half of which is currently vegetation and the rest is currently impervious. Meeting the 5% increase target would require establishing tree canopy on over 60 of these 400 acres. In addition, it will be challenging to maintain existing canopy cover. Besides natural tree mortality, new development planning assumptions that include large buildings along the commercial corridors only provide for perimeter street trees. In the residential areas, there is a clear trend toward larger houses that leave less space for canopy cover.

Despite the difficulty of the challenge, attaining these tree canopy targets will have significant environmental and economic benefits. A single 38 foot tree will hold rainwater and reduce storm water runoff in a single event by 290 gallons, reducing soil erosion and flooding, and protecting streams. Mature trees providing full canopy absorb 148,000 gallons per year per acre in the DC area. A 2012 report by Virginia Polytechnic Institute^{viii} found that trees in Falls Church provide diverse benefits including:

- Carbon storage: 21,100 tons (valued at \$388 million)
- Annual gross carbon sequestration: 970 tons (valued at \$17,900)
- Annual avoided carbon emissions: 307 tons (valued at \$5,654)
- Annual pollution removal: 19 tons (valued at \$138 thousand)
- Annual building energy savings: \$219 thousand

A report by the Metropolitan Washington Council of Gov'ts identified tree plantings as a critical step communities can take to reduce greenhouse gases and mitigate the impacts of global warming^{ix}.

Healthy trees also have social benefits for a community. The report by Virginia Polytechnic Institute^x identified 3,934 “street trees” in Falls Church and estimated the gross annual value at \$669,000 with a replacement value of over \$16 million. Several studies have found that in areas with trees, people have reduced stress levels and crime rates are lower. In areas with more street trees and greenery, people perceive walking distances to be shorter, which makes cities more “walkable.” Trees also provide economic value. A recent study found that people were willing to pay up to 12% more for products if the business district had large trees^{xi}. Not only that, they judged the merchants to be more helpful and the products to be of higher quality. In addition, healthy trees can also add up to 15% to property values^{xii}.

Next Steps

A critical first step for the City is to identify a specific and standardized method for measurement of tree canopy and commit to periodic assessment and reporting of changes in tree canopy City-wide.

In addition, the City should undertake actions to improve progress toward the tree canopy goal including:

- work with residents, home owners' associations and commercial land owners to find opportunities to use City Stormwater Utility Fee funds to support expansion of tree cover on public and private property within the City;
- enforce the maximum impervious surface limits in the City code at construction and after to ensure that current and future properties can support shade trees;
- expand outreach to promote education of our residents and students about the benefits of trees and tree care;
- fully staff the urban forestry crew;
- continue to support the Neighborhood Tree Program; and
- improve cooperation with residential and commercial developers to protect and restore trees that might be lost to development, including strengthening the 20% minimum canopy requirement for development projects if it is found that this requirement is resulting in a net loss of tree canopy.

2) Increase Residential Solid Waste Recycling

GOAL Increase the percentage of residential waste that is recycled.

2007 Baseline	53% of residential waste recycled
2010 Status	60.4%
2011 Status	64.4%
2012 Status	69.3%
2013 Status	62.9%
Long-term Goal	75% of residential waste recycled by 2020



The City of Falls Church has long been recognized as a pioneer in operation of effective solid waste recycling programs. In 2007, the City of Falls Church recycled 53% of the solid waste that it collected from residential sites, the second highest rate in the State of Virginia. In 2012, the residential recycling rate increased to 69.3 %, the highest rate in the State, but declined to 62.9% in 2013^{xii}. In 2009, VPIS called for a goal of 60% to be attained by 2015. Although rates have varied year-to-year, the City has made substantial progress in improving the residential recycling rate.

While the City's rate of recycling is an important achievement, many communities across the country have higher recycling rates or have set goals for higher rates. For example, the City of San Francisco achieved a rate of 80% in 2013. Portland, Oregon has adopted a goal of 75% by 2015. In the 2014 Solid Waste Management Plan^{xiv}, the Falls Church set a goal of a 65% residential recycling rate. The City should redouble its efforts with the goal of increasing the residential recycling rate to 75% by 2020.

Increasing recycling rates has numerous advantages for the City. Recycling generates a revenue stream that helps pay for the City waste management program more generally. Removing material from the waste stream not only reduces the cost of disposing of material that is not recycled, it also helps address climate change because recycling of materials uses much less energy than making products from virgin material. In addition, recycling is a practical way for every City resident to be an active participant in protecting the environment.

Next Steps

The City recycling procedures termed “single stream” in which all recyclable materials (e.g. paper, glass, and plastic) are managed in a single box have contributed to this success. Some additional steps the City might take to further improve the recycling rate include:

- develop new programs that provide incentives based on individual household recycling (e.g.: Recyclebank);
- increase the use of existing media to further promote the advantages of recycling (e.g.; Falls Church eFocus)
- update the City website to provide more regular reports of recycling rates; and
- report recycling rates by neighborhood.

Although the City has made substantial progress in improving residential solid waste recycling rates, more needs to be done to broaden the range of material recycled by expanding programs for recycling at commercial buildings. As a first step in engaging commercial building owners, the City should develop baseline data concerning existing rates of recycling at commercial buildings, work with the Chamber of Commerce and other organizations representing local businesses to identify incentives to expand recycling and define strategies for implementing these incentives.

The City should also expand efforts to manage electronic waste (i.e.; computers, printers, and related items) and compost food and other waste. For example, the City could support development of rain gardens and related stormwater management practices by making soil augmentation media (e.g.; compost, leaf and wood mulch) available for use in parks and by interested property owners.

3) Climate Change – Reduce Release of Greenhouse Gases



GOAL Reduce emissions of greenhouse gases that contribute to global warming from both City government operations and also from all City residents and businesses.

2008 Baseline	12.9 metric tons per person in 2008
Interim Goal	20% reduction below 2008 baseline (10.32 metric tons) by 2020
Long Term Goal	75% reduction below 2008 baseline (3.2 metric tons) by 2050

Global warming is now recognized by a 97 percent of climate scientists as a significant threat to the planet.^{xv} Human activities resulting in the release of carbon dioxide and other “greenhouse gases” are causing average air and water temperatures to rise, changing the amounts and intensity of rainfall, and causing a rise in sea levels.

A warming planet will have serious impacts at both a global scale and more locally in the City of Falls Church. Some of the expected impacts of global warming in northern Virginia are identified in the table below:

Northern Virginia Impacts	By 2030	By 2095
Temperature	+1.8 to 2.7	4.9 to 9.5
Precipitation	-1 to +8”	6 to 24”
Sea Level Rise	4 to 12”	15 to 40”

Other projected impacts include:

- an increase of days over 100 degrees F from 3 to 30 by late century;
- stronger and more frequent heat waves;
- heavier rainfall leading to increased water pollution and runoff;
- increased health risks including heat strokes, respiratory problems, asthma, and infectious diseases.^{xvi}

In 2013, Falls Church joined the Clean Air Cities campaign that supports use of the Clean Air Act to reduce greenhouse gas pollution to head off catastrophic climate change. Also in 2013, the City joined the Green Power Communities Program of the Environmental Protection Agency. The City overall is using more than 4 million kilowatt-hours (kWh) of green power annually, which is enough green power to meet the 3 percent requirement set by EPA^{xvii}. The community is generating renewable energy and buying renewable energy certificates (RECs).

Despite these positive steps, the City has not established clear goals for reducing carbon pollution from City facilities or from the residential and commercial sectors of the City. Without clear targets and the programs needed to make attainment of the targets a reality, the City progress in this area can only be described as limited.

The Metropolitan Washington Council of Governments published a major report on climate change in November 2008^{xviii}. The report calls for local jurisdictions to participate in the effort to reduce energy use and reduce release of greenhouse gases. The report proposes that, by 2012, local communities reduce greenhouse gas releases to the levels that occurred in 2005 and, by 2020, reduce greenhouse gas releases by 20% from the 2005 baseline. The long-term, 2050 target is to reduce releases of greenhouse gases by 80% from the 2005 level and Falls Church should adopt a comparable target. Arlington County recently adopted a goal of a 75% reduction in metric tons per person from the 2007 baseline by 2050 (from 13.4 to 3 metric tons).

Next Steps

The City of Falls Church established a Task Group in 2008 to review the existing contribution of greenhouse gases from the operations of the City government and from the City overall. However, with the loss of key City staff, the Task Force is no longer active. As a first step toward the carbon reduction goals, the City should reestablish the Task Force and charge it with developing a consistent method for estimating the greenhouse gas releases across the City, setting clear reduction goals, and defining programs and policies to meet the goals. A focus of the Task Force should be drafting a community energy plan as part of the City Comprehensive Plan, modeled after the Arlington Community Energy Plan.^{xix}

For example, the City is rated under the Go Green Virginia program as “Green” with between 100-125 points awarded as a result of “practical action to reduce carbon emissions.”^{xx} Adopting more of the actions identified by the Go Green Virginia program would be a positive next step (over 25 Virginia communities scored between 125 and 200 points). The City should also support actively the “Solarize NoVa” program working to promote the implementation of solar power projects in communities across Northern Virginia.

4) Increase "Green" Surfaces to Reduce Stormwater Runoff



GOAL Increase the percentage of “green” or “effective pervious” surface to reduce stormwater runoff and protect local streams.

2001 Baseline	60% green/pervious surface (i.e.; 40% impervious)
2011 Status	58.7% (i.e.; 41.3% impervious)
Interim Goals	65% effective pervious surface by 2020 75% effective pervious surface by 2025
Long-term goal	85% effective pervious surface by 2030

Rainfall is a good thing, but too much intense rainfall during a storm event is often a bad thing. Runoff from storms can cause flooding of homes, damage to infrastructure, erosion of soil, degradation of wildlife habitat, and transport of pollutants to local streams and downstream waterbodies, such as the Chesapeake Bay. Intense storms often result in high velocity and high volume stream flows that scour biologically productive streambeds and destroy aquatic ecosystems.

The City has taken effective steps to address stormwater runoff in the past five years. In 2011, the City adopted an updated Watershed Management Plan, reporting that impervious surface was 41.3% (i.e.; 58.7% green/effective pervious)^{xi}. And, in 2013, the City enacted a new Stormwater Utility Fee to provide funds to support stormwater management projects. The fee is based on the amount of “impervious surface” on each parcel of land within the City.

Unfortunately, despite the new investments in stormwater management projects, the amount of land area across the City that is effectively “pervious” (i.e.; will allow rain to filter into the land where it falls) has not increased. Because the City’s development of new capacity to manage stormwater has not yet resulted in a long-term program to infiltrate stormwater at sites near where it falls, progress in this area is best described as moderate.

The best way to reduce the damaging impacts of storm water runoff is to manage the land areas of the watersheds so that water filters into soil and groundwater, is temporarily retained on site, or is taken up by trees and other vegetation. As communities become more developed, the land area covered by impervious surfaces, such as roads, roofs, and driveways increases and the land area capable of infiltrating or retaining rainfall is decreased. Most recent studies indicate that in watersheds where more than 15% of the land area is impervious surface,

impacts on local stream ecosystems become significant^{xxii}. Looked at another way, significant storm water impacts are expected when “green” or pervious surfaces are less than about 85% of land area.

Many suburban areas, such as the City of Falls Church, have impervious surfaces that cover far more than 15% of land area. In the City of Falls Church, impervious surfaces cover about 40% of the land area while about 60% of land area remains “green” and pervious. As a result of this high percentage of impervious surfaces, the City has been experiencing a range of stormwater impacts including flooding of homes and degradation of local streams for many years.

It is not practical to convert existing roads, roofs and other impervious surfaces back to green fields. It is possible, however, to install storm water management practices that reduce the rate of runoff from a given land area, thereby creating “effective” pervious surface. For example, the land area of a watershed might be 60% “green” or pervious and 40% impervious. If storm water management measures, such as rain barrels, rain gardens, roadside infiltration beds, tree wells with curb cuts, retention areas, and green roofs are installed the cumulative effect of these practices can be estimated using engineering models. With these practices in place, the watershed might function as if 85% of the land area were “green” or pervious surface. A helpful guide to municipal actions to support these measures is available at the EPA stormwater website.^{xxiii}

Next Steps

The City of Falls Church should begin the process of developing and implementing stormwater management practices in watersheds in the City that are designed to result in an “effective pervious surface” of at least 85%. Implementation of storm water management practices by the City and private landowners will take time but will result in a gradual increase in the current 60% “effective pervious surface” in the City. The City should adopt interim goals of 65% effective pervious surface by 2020 and 75% by 2025, with a long-term goal of 85% by 2030.

Although 85% effective impervious is an ambitious goal, the City has the tools in place to make significant progress. Maintaining effective enforcement of the existing impervious surface limits in City ordinance is a key step. In addition, the Stormwater Utility Fee generates \$1.6 million per year. To date, this funding has supported large projects that are designed to simply hold stormwater for later discharge or more expeditiously carry stormwater outside the City jurisdiction. In the future, the

City should invest stormwater fees in smaller scale projects that are designed to infiltrate stormwater into the land close to where it falls.

The City should work closely with local landowners, including large landholders such as churches and businesses, to make it easier for property owners to cost effectively install run-off mitigation projects. This could include making infiltration media (mulch, compost mixes, sand) available for free or at low cost to property owners who want to install infiltration features such as soil augmentation, infiltration swales, rain gardens, tree wells). The City should also revise the stormwater fee credit system to give greater credit to landowners who work with the City to reduce stormwater runoff. Finally, the City should establish a citizen board to oversee the operation of the Stormwater Utility Fee, including policies related to the fee and decisions concerning the investment of funds in projects.

5) Promote Building Environmental Standards

GOAL Expand existing City policy that new City buildings meet at least the “Silver” level in the Leadership for Energy and Environmental Design (LEED) program to include new school buildings and adopt incentives for attainment of LEED ratings by large new and existing commercial buildings.



2009 Baseline	Several LEED rated commercial buildings completed or proposed in the City
2015 Status	Additional new large commercial buildings have met LEED standards and the City adopted LEED Silver as the goal for City buildings other than schools
2015 Goal	Expand City policy for at least LEED "Silver" for City buildings to include schools; adopt incentives for attainment of LEED ratings by large (i.e.; over 10,000 square feet) new and existing commercial and residential buildings
Interim Goal	At least 75% of new and 5% of existing large commercial and residential buildings in the City have a LEED rating by 2020
Long-Term Goal	At least 90% of new and 10% of existing large commercial and residential buildings in the City have a LEED rating and by 2025

Since 2009, the City of Falls Church has made progress in promoting the development of environmentally sustainable buildings. The City adopted a policy that new and renovated City-owned buildings should meet the “Silver” building standard under the LEED program, although the City did not apply this policy to City school building projects. In addition, the City has encouraged owners of large new development projects to commit to designing new buildings to meet the Silver LEED standard. Several large new buildings have met this standard and the “Flower Building” earned a Gold rating under the LEED program.

The City, however, has not followed the lead of neighboring communities of Fairfax and Arlington Counties and the City of Alexandria in adopting incentives for LEED Silver design of new large commercial buildings. And, the City has not considered incentives to encourage owners of existing large commercial buildings to meet LEED standards. Because of the lack of a clear commitment to LEED standards in City schools buildings and large new commercial buildings, and the lack of incentives for existing commercial buildings to implement LEED standards, progress in this key area is best described as moderate.

Well-designed commercial buildings play a critical role in promoting the environmental sustainability of local communities. The many factors that make up an environmentally sustainable commercial building are identified in the LEED rating system. Some of these factors include:

- reduced energy consumption;
- water conservation;
- improved storm water management;
- conservation and reuse of materials;
- location in proximity to transportation systems; and
- protection of indoor air quality.

Each of these factors is scored based on criteria and the overall score is totaled to determine an overall building rating such as “Certified,” “Silver,” or “Gold.”

A commercial building meeting the minimum rating under the LEED standards contributes to the local environment by managing storm water, using less public water, and reducing greenhouse gases by requiring less energy for building operations and for transportation of building users. Residents or tenants of the building also benefit from higher quality of indoor air, better exposure to sunlight, and lower energy and water utility rates.

Next Steps

With respect to expansion of the existing City policy for LEED for City buildings, the City Council should amend the policy to clearly include school buildings.

With respect to large new and existing commercial and residential buildings, the City should adopt incentives that will encourage developers and building owners to attain at least the LEED Silver rating. Incentives might include:

- reductions in water and sewer rates;
- expedited permit review;
- reduced permit fees (e.g. 5-15%);
- recognition on a City operated website; and
- adjustments in requirements of the zoning ordinance.

A comprehensive list of incentives adopted by municipalities is available on the US Green Building Council Website.^{xxxiv}

Endnotes

ⁱ <http://www.vpis.org/event.php?id=84>

ⁱⁱ http://urbanforestry.frec.vt.edu/documents/eco/fallsch_eco.pdf ; p2 iTree Ecosystem Analysis; City of Falls Church, Urban Forest Effects and Values; 2012

ⁱⁱⁱ http://gis.w3.uvm.edu/utc/Reports/TreeCanopy_Report_GreaterFairfaxCounty.pdf ; Draft; A Report on Greater Fairfax County's Existing and Possible Tree Canopy; University of Vermont; 2013

^{iv} District of Columbia Urban Tree Canopy Plan; January 2013
http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/page_content/attachments/Draft_Urban_Tree_Canopy_Plan_Final.pdf

^v Watershed Forestry Resource Guide; A PARTNERSHIP OF THE CENTER FOR WATERSHED PROTECTION AND US FOREST SERVICE - NORTHEASTERN AREA STATE & PRIVATE FORESTRY
<http://www.forestsforwatersheds.org/urban-tree-canopy/>

^{vi} Green Infrastructure Digest; February 2015; <http://hpi.green.com/>

^{vii} http://gis.w3.uvm.edu/utc/Reports/TreeCanopy_Report_GreaterFairfaxCounty.pdf ; Draft; A Report on Greater Fairfax County's Existing and Possible Tree Canopy; University of Vermont; 2013

^{viii} http://urbanforestry.frec.vt.edu/documents/eco/fallsch_eco.pdf

^{ix} National Capital Region Climate Change Report
<http://www.mwco.org/uploads/pub-documents/zldXXg20081203113034.pdf>

^x Street Tree Assessment Report Falls Church, Virginia, July 2012
<http://urbanforestry.frec.vt.edu/STREETS/reports/FallsChurchReport.pdf>

^{xi} City Trees for Beauty, Health, and Economic Value; Trees, People, and the Built Environment II: Kathleen L. Wolf, Ph.D., Research Social Scientist; College of the Environment, University of Washington (Seattle, U.S.A.) <http://www.charteredforesters.org/opinion/item/206-economic-value-trees-kathleen-wolf/>
continued >

Endnotes continued

- ^{xii} City Trees for Beauty, Health, and Economic Value; Trees, People, and the Built Environment II: Kathleen L. Wolf, Ph.D., Research Social Scientist; College of the Environment, University of Washington (Seattle, U.S.A.)
<http://www.charteredforesters.org/opinion/item/206-economic-value-trees-kathleen-wolf/>
- ^{xiii} VIRGINIA ANNUAL RECYCLING SUMMARY REPORT Calendar Year 2013
<http://www.deq.virginia.gov/Portals/0/DEQ/Land/RecyclingPrograms/2013%20recycling%20rate%20report%20Final.pdf>
- ^{xiv} City of Falls Church Solid Waste Management Plan;
<http://www.fallschurchva.gov/DocumentCenter/Home/View/605>
- ^{xv} WHAT WE KNOW: The Reality, Risks and Response to Climate Change, American Association for the Advancement of Science (2014)
http://climatenexus.org/wp-content/uploads/2014/03/AAAS-What-We-Know_3.17.14.pdf
- ^{xvi} National Capital Region Climate Change Report
<http://www.mwco.org/uploads/pub-documents/zldXXg20081203113034.pdf>
- ^{xvii} City of Falls Church Press Release; October 2103
<http://www.fallschurchva.gov/DocumentCenter/View/1079>
- ^{xviii} National Capital Region Climate Change Report Adopted by the COG Board of Directors on November 12, 2008 <http://www.mwco.org/uploads/pub-documents/zldXXg20081203113034.pdf>
- ^{xix} <http://freshaireva.us/2012/04/energyplan/>
- ^{xx} Go Green VA Website: http://www.gogreenva.org/?/green_government_challenge
- ^{xxi} City of Falls Church; Watershed Management Plan; 2011;
<http://va-fallschurch.civicplus.com/DocumentCenter/View/769>
- ^{xxii} Protecting Water Resources and Managing Stormwater
http://extension.unh.edu/resources/files/Resource002615_Rep3886.pdf
- ^{xxiii} http://epa.gov/owow/ocpd/green_infrastructure_roadshow.pdf
- ^{xxiv} <http://www.usgbc.org/Docs/Archive/General/Docs691.pdf>

*More information about VPIS is available on our website: **www.vpis.org***