

CLIMATE, ENVIRONMENT & READINESS (CLEAR) PLAN



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Climate, Environment and Readiness Plan for
Virginia's George Washington Region

Climate, Environment & Readiness (CLEAR) Plan

CLIMATE, ENVIRONMENT AND READINESS PLAN FOR VIRGINIA'S GEORGE WASHINGTON REGION

CLEAR is an initiative of the **University of Mary Washington** made possible by financial support from environmental consulting firm **Marstel-Day LLC**, the **National Academy of Environmental Design, Atlantic Builders**, the **Virginia Environmental Endowment** and the **PNC Foundation**.

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INTRODUCTION: OUR MESSAGE IS CLEAR

Climate, Environment & Readiness (CLEAR) Plan

Welcome to the Climate, Environment and Readiness (CLEAR) Plan for Virginia's George Washington Region. This plan is a both a road map and action plan for preserving and improving the natural environment, the quality of life and the economic health of the city of Fredericksburg and the counties of Spotsylvania, Stafford, King George and Caroline through responsible management of our most precious resources.

The natural infrastructure around us forms the foundation that keeps the Region healthy, and in turn supports commerce, tourism and quality of life. Often overlooked is the fact that nature is among the most powerful technologies in existence for cost-effectively purifying air and water, and providing a steady stream of other benefits ranging from protection against severe weather events to outdoor enjoyment to forming the basis of nearly every business sector.

Businesses must be able to depend on a steady supply of the resources they need. Raw materials must come in by train or truck on the land, air or water transportation network. Water must be available and flowing through the pipes. Electricity and other forms of energy are crucial to most modern processes and communications networks are indispensable.

Residents need to be able to count on the availability of water, roads, electricity and communications. They need to know that the first responders who can help them in an emergency can get to them and that the hospital will be ready to help them, should they need it. They want to know that their children's schools won't be shut down for too long if the region faces a natural disaster, and that basic government services they depend on will continue to operate.

In 2012, the University of Mary Washington began a partnership with businesses, nonprofits, public agencies and interested residents throughout the Region to develop the CLEAR Plan. The University chose to champion this effort out of an understanding that the Region's natural systems form a foundation that is critical to the health of our people, our economy, and our institutions and infrastructure. Because the University draws its strength and viability from the surrounding localities, the University has a duty to play a leadership role in strengthening these systems.

Improving the Region's ability to adapt to gradually changing weather patterns as well as recover from more precipitous natural disasters will make the George Washington Region a more attractive place to do business and a more economically stable and secure place to live and work.

To these ends, the plan incorporates four major areas: Environment and Habitat; Community Resilience; Emergency Preparedness and Economic Development.

The objectives of CLEAR can be viewed through the three elements of the name itself:

Climate

As documented in the following pages, the George Washington Region can expect both gradual changes in climate as well as more intense natural disasters such as we have seen over recent years to pose increasingly serious threats. Our intricate network of streams and rivers will bring more damaging floods as we see more intense rain events and overall sea level rise. An increasing number of record-high-

temperature days will put a strain on our electrical grid, our air quality and the support systems for our most vulnerable populations. Key sectors of the economy, such as agriculture, will continue to see significant adverse impacts from temperature fluctuations and issues of water supply. Businesses of all sizes will need to determine how climate change will require adaptation strategies. Biodiversity will be at risk as a changing climate forces certain species out of our area.

CLEAR seeks to protect public and private investments by creating a plan that can help us adapt to gradual climate changes as well as bounce back from floods and other disasters. CLEAR will encourage investment in the kind of green infrastructure—including both natural and man-made systems—that can help buffer this region from intense changes and help us respond to these threats. That work must include protocols to ensure that the elderly, disabled and infirm are protected in the event of a disaster.

Environment

Even without the threats posed by a changing climate, the Region's health depends on good management and protection of our air and water quality, our forests, fields and open spaces, our cultural and historical treasures and the diversity of land-use patterns that make the region functional and attractive.

CLEAR's goal is to bring the various localities and stakeholders in this region together to develop a unified approach to these issues. Past practices have proven that it takes a regional approach to truly optimize these resources.

Readiness

Our economy, institutions and infrastructure must be prepared to address the challenges ahead. To that end, CLEAR will encourage and invest in the development of disaster response plans, efforts to diversify our economy with green jobs and programs that promote a more efficient use of resources at all levels—from the homeowner to the business owner to the county government. Key fixed assets of water, energy and wastewater may need to be "climate-proofed" and/or made more energy efficient. Our mobility and transportation systems will need to be examined in that same light.

A TRUE PARTNERSHIP

This effort was aided by financial support from environmental consulting firm Marstel-Day LLC, the National Academy of Environmental Design, Atlantic Builders, the Virginia Economic Endowment and the PNC Bank Foundation.

On Nov. 13, 2013, more than 55 people representing every locality within the George Washington Region gathered at UMW's Jepson Alumni Executive Center for a focused discussion of how to make this region more resilient. Participants broke into five groups to focus on specific areas of concern. Those five topics, subsets of the overall focus on climate, environment and readiness, were:

Climate	Environment	Readiness
Community Resilience	Soil and Water	Emergency Preparedness
	River and Open Space	Economic Development

The work of those five groups led to the goals and action plans laid out in this plan.

EVERYBODY HAS A ROLE TO PLAY

The overall goal of the CLEAR plan is to unite the region around efforts to make this area more resilient and sustainable. Everyone—from students to business owners to homeowners to politicians—has a role to play in this effort.

To that end, we want to make sure to document the efforts of this group for all to see. Every section of this report includes a scorecard that CLEAR partners will use to track progress on specific goals.

Within one year of the publication of this report, CLEAR will launch a series of outreach events aimed at engaging all sectors of the public and educating them about our progress and our needs. These will include presentations to local elected boards, social and traditional media campaigns, an updated report on our website and a series of fun and engaging events that will help educate local residents of all ages and backgrounds about what they can do to promote the resilience of the George Washington Region.

ONE CLEAR GOAL: RESILIENCE

Few regions combine natural beauty, rich history, livable neighborhoods and proximity to major cities to the same degree that the localities of Virginia’s George Washington Region enjoy. The city of Fredericksburg and Stafford, Spotsylvania, Caroline and King George counties have a lot of enviable features, including vast public parks, protected lands rich in beauty and natural resources, strong schools, a central downtown business district that has remained vital since before the American Revolution and a thriving economy that draws its strength from the federal government to the north, proximity to Interstate 95 and a growing entrepreneurial culture within the region itself.

What can we add to this list of attributes that will ensure that the already strong quality of life in the George Washington Region improves for generations to come, and that the Region becomes more attractive to potential employers? In a word, resilience.

Resilience is the capacity to become strong, healthy, successful or productive again after something bad happens. For communities that wish to attract high-quality employers and to retain an optimum quality of life for their residents, this is crucial. When we talk about resilience in this plan, we are talking about the ability of this Region's basic infrastructure—its wetlands and forests, open spaces and agricultural lands, roads, water and electric utilities, communications networks, emergency services, healthcare institutions, government and commerce to regain functionality after a traumatic event, such as a natural disaster, drought or sustained resource shortage.

All of us have an interest in building the resilience of some of our most treasured resources, such as the pristine beauty of preserved Civil War battlefields and riparian vistas, the quantity and quality of our drinking water supplies, the productivity of our agricultural lands and our rich historical heritage. These factors all play into residents' decisions to stay here now and employers' decisions to locate here in the future.

WHAT'S AT STAKE?

There is ample evidence that the world as we know it is changing. These changes will challenge our natural resources. They are already bringing weather events that disrupt our daily lives and our region's economy. The more we as a region do to anticipate and prevent the effects of these events, the more resilient we will be.

The George Washington Region has already had a glimpse of the risks posed by the increasing frequency and intensity of extreme weather events. In the winter of 2009-2010, a series of heavy snow events familiarly known as "Snowmageddon" wiped out state and local budgets for snow removal and road treatment, and tested our abilities to keep the most vulnerable populations sheltered and connected. The winter of 2014 has forced schools to cancel exams, reschedule holidays and take other disruptive measures to make up for missed instruction days due to winter weather.

On June 29, 2012, a severe thunderstorm we now know as a "derecho" hit our area hard. More than 100,000 people in the Fredericksburg area lost electricity, and some remained without power for as long as a week, as temperatures soared into the 90s. Gov. Bob McDonnell declared a state of emergency and said the storm caused the largest non-hurricane power outage in Virginia history, and the fifth-largest overall.

The George Washington Region's geographic position, right on the line that divides Virginia's coastal plain from its piedmont, gives it great natural diversity, but it also puts us at risk for loss due to increasing storm surges from more intense hurricanes and other storms, and from rising sea levels.

Hurricane Sandy, which battered the New York and New Jersey coasts in 2012, was the second-costliest hurricane in United States history. Early weather models projected that Sandy would make landfall near the Fredericksburg area. If Sandy's 6-meter storm surges had hit the George Washington Region, large areas of land, including homes, farms, roads and other important assets, would have been underwater.

The potential for flooding puts some of our most productive areas at risk. Downtown property owners have begun voicing concern that the rising cost of mandatory flood insurance for properties near the

Rappahannock River could stifle economic development downtown. The threat of flooding has no doubt slowed progress towards some of Fredericksburg's goals for redeveloping its riverfront, and poses a risk to a number of key historic properties. That threat, which also applies to residential and commercial properties along the Rappahannock and Potomac rivers in Spotsylvania, Stafford, King George and Caroline counties, will only get larger as storms intensify and sea level rises.

At a Nov. 14 community planning meeting organized by CLEAR, Prof. Grant Woodwell of the Department of Earth and Environmental Sciences at the University of Mary Washington shared the following findings:

- Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850, according to a 2013 report from the Intergovernmental Panel on Climate Change. By the end of the 21st century, global surface temperature change is likely to exceed 1.5 degrees Celsius, and could exceed 2 degrees Celsius.
- Sea level has risen more drastically since the mid-19th century than it had during the previous two millennia, according to the IPCC report. During the 21st century, sea level is expected to rise faster than it did from 1971 to 2010, due to increased ocean warming and increased melting of glaciers and ice sheets.
- Atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years, according to the IPCC report.
- A 2012 report from Munich RE found that weather risks are changing faster in North America than anywhere else in the world, and that extreme weather phenomena cause rising damage each year.
- Federally declared weather-related disasters since 2007 have affected counties containing nearly 243 million people, or almost four out of five Americans, according to a 2013 report from Environment America.
- The United States is simultaneously experiencing more extreme rain events and higher risk of drought, according to Environment America.

Woodwell concluded from his research that the George Washington Region should expect the following in the future:

- More frequent, and more intense, precipitation events punctuated by deeper episodes of drought.
- Drier winter and summer seasons, which could deplete reservoirs and challenge agricultural production.
- Unprecedented storm surges along tidal portions of the Potomac and Rappahannock rivers, caused by rising sea level and stronger Atlantic tropical storms.
- Stronger storms coming at a greater frequency, which may threaten lives, damage infrastructure and cause significant power outages.

- Increasing summer heat waves that could threaten public health.

WHAT WE MUST PROTECT

The population of the George Washington Region has grown by 100.8 percent since 1990, according to figures from the Weldon Cooper Center for Public Service and the U.S. Census Bureau. That makes this region one of the fastest-growing in the state. Virginia as a whole has seen population growth of 33.5 percent since 1990. This growth has brought great economic opportunity and in many ways has improved quality of life by bringing goods and services that had not been available before, as well as more money for schools and other services. However, it has also taxed our region's transportation networks and other public infrastructure, and has resulted in a loss of open space, trees and wildlife. A significant increase in impervious surface has taxed our stormwater management systems and poses threats to the quality of our waterways. Combined with the effects of global climate change, these threats make it imperative that we act now to protect the following critical assets.

Natural infrastructure

Our natural infrastructure forms the basic support system for life as we know it. Forests—both urban and wild—rivers and their watersheds, open spaces and the habitats that support plant and animal species are of utmost importance, and they are at risk. A 2008 report by former Gov. Tim Kaine's Commission on Climate Change stated that, "at varying rates, vegetation ranges are moving from current locations to higher altitudes and latitudes. The effect of this will be that suitable habitat for some species will decline, other species will become extirpated, and other species will become extinct. Climate change also will exacerbate threats already faced by Virginia ecosystems, such as invasive species, pathogens and pollution."

Vulnerable populations

Planners at the state and federal levels have recognized the elderly and the very young, those of low socioeconomic status, members of racial and ethnic minorities, people living in coastal areas and flood plains, and the disabled and infirm as being at greater risk to the impacts of climate change. Special efforts are needed to protect these groups.

Cultural and historic sites

Places with special ties to our heritage are key to the identity of the George Washington Region, and play a role in its economic health and quality of life. In many cases, the interests of historic preservation align with environmental concerns. Retrofitting or renovating an existing structure instead of building new can often prevent excess building materials from ending up in the landfill. Preserving important lands, such as Civil War battlefields, can ensure our region maintains sufficient open space and animal habitats.

Agricultural and working lands

Farms and other working lands comprise a critical component of this Region's ability to sustain itself. Protecting our local food supply from threats posed by flooding, drought, overdevelopment and increasingly severe storms is crucial. The 2008 Governor's Commission on Climate Change final report identified the agriculture, forestry and commercial and sport fishing industries as susceptible to the effects of climate change, and stated that more research is needed to adapt and prepare for these changes.

Jobs

Jobs are a basic need of any community. We must identify potential risks to existing employers from the effects of climate change to help them avoid disruptions to their operations. By "greening" the economy of the George Washington Region, we can protect existing jobs and create new ones in growing green industries. Becoming a more resilient community will make this Region more attractive to potential new employers.

Infrastructure

All of our Region's infrastructure faces threats from climate change. Stormwater systems will need to accommodate larger flows of water that will come from increasing storm intensity. Utilities infrastructure will need to be able to withstand greater forces of nature. A finite amount of land is available for landfilling waste products, and we must use this wisely. Both the quality and quantity of our Region's drinking water supplies must be monitored and protected. Our information and communications networks have become indispensable to life as we know it. They must be buttressed against the threats to come, and we also must find alternatives to ensure we stay connected when disaster happens.

Transportation

Roads are already a hot-button topic within the George Washington Region. We must fine-tune our systems of mobility so that we all drive fewer miles, both to reduce our greenhouse-gas emissions and to improve our quality of life. Public transit systems should be strengthened to become a dependable daily transportation option, and to be able to move large numbers of people in case of an emergency.

STRATEGIES FOR PROTECTION

Natural environment and habitats

While many new and developing technologies offer promises of progress toward sustainability goals, most often we need look no farther than nature to find the tools we need. Forests and open spaces can help purify our air and water, and aid in stormwater management. Protecting the habitats of native species ensures the stability of our Region's ecosystem, and can help prevent invasive species from taking root.

Economic development

By focusing economic development efforts across the George Washington Region on companies and industries that have both growth prospects and a demonstrated potential to contribute to the goals outlined in this plan, we can pursue sustainability goals while also strengthening our Region's economy. Examples of industries to pursue include clean technology, green buildings, materials management and recycling, local food and sustainability services and education, along with other emerging sectors. Many opportunities also exist to assist our current top employers in improving their emergency management plans and resiliency and in greening their operations.

Disaster planning and emergency preparedness

Promoting a community-wide understanding of the changing weather patterns, potential resource shortages and other threats our Region faces as a result of climate change is important at both the institutional and individual levels. We must promote awareness of the changes that are coming and provide tools and forums to help government agencies, schools, businesses, neighborhoods and households prepare for these threats.

Community resilience

All of these strategies will contribute to the overall resilience of our Region. Resilience should become a goal that is part of the decision-making process in all public policy matters, and also in private business and individual matters. CLEAR will seek to promote ways that all of these groups can promote resilience through their actions. CLEAR will also promote greater awareness of these issues, through education at the K-12 level, outreach to the business community and with an overall communications effort directed at every sector of our Region.

WHAT ARE WE ALREADY DOING?

There is much work to do to optimize our emergency response systems, basic infrastructure and communications protocols to make our region as resilient as possible. There is also much we can do to try to prevent the further erosion of our natural defenses and resources. However, our Region has not been blind to these risks thus far.

In 2011, the George Washington Regional Commission published a Regional Green Infrastructure Plan. This plan was the product of a multi-year effort that included comprehensive data and mapping projects. This plan quantified the Region's impervious surface and tree canopy, and identified trends in these two development patterns. That research showed that between 1996 and 2009, the combined loss of tree canopy and increase in impervious surface resulted in a regional loss of stormwater and air pollutant management capacity worth an estimated \$1.8 billion. The Green Infrastructure Plan also identifies conservation corridors, impaired waterways and other priorities, and provides an invaluable data set that should be consulted by all planning commissions, developers and other interested residents and businesses within the George Washington Region. The Green Infrastructure Plan's discussion of the many political, legal and social tools available to promote environmentally friendly development practices is an important reference. Many of the Green Infrastructure Plan's recommendations have been embraced in this plan.

In spring 2013, Fredericksburg Mayor Mary Katherine Greenlaw signed the U.S. Mayors Climate Protection Agreement. Fredericksburg has made progress in many of the 12 areas of environmental action indicated in this agreement. Among them:

- Fredericksburg's partnership with the volunteer-led Tree Fredericksburg has resulted in the planting of nearly 3,400 new trees throughout the city since 2009. The city's tree canopy, at 44 percent, is already the fifth-highest in Virginia, and Fredericksburg and Tree Fredericksburg have committed to increasing the canopy by at least 5 percent by 2020.

- Fredericksburg is aggressively moving forward with plans for trails to link different parts of the city. The Rappahannock River Heritage Trail that opened in 2012 has been popular among residents of the entire region, and the Virginia Central Railroad Trail is expected to open in 2014.
- The new courthouse under construction in downtown Fredericksburg is being built to LEED Silver standards.

The Rappahannock Regional Solid Waste Management Board, a partnership between Stafford County and Fredericksburg, is consistently a leader in the state in recycling efforts, and offers valuable resources to residents, including opportunities to recycle and information on composting and other waste-reduction practices. According to 2012 data from the state Department of Environmental Quality, the R-Board, as it is known, achieved a recycling rate of 49.4 percent, which is the highest in the George Washington Region and beats the state average of 41.5 percent. King George County was also cited in the 2012 recycling report from the Department of Environmental Quality for drastically increasing its recycling efforts. Its rate of 44.7 percent was the second-highest in the region. Spotsylvania County was next, at 44.6 percent, and Caroline County reported a recycling rate of 19.5 percent.

Private landowners in the George Washington Region are also doing their part. Silver Ridge Farm, owned by the Silver family of White Oak, in Stafford County, was recently recognized by U.S. Department of Agriculture Secretary Tom Vilsack for its conservation efforts, which include nutrient-management practices, no-till planting and the use of cover crops, all of which help keep soil, sediment and excess nutrients out of the Chesapeake Bay. Other farmers in our area are using conservation easements and adding agri-tourism and community supported agriculture programs to their business mix in order to ensure their farms remain open space for years to come. These efforts should be lauded and encouraged.

Friends of the Rappahannock has for years been a leader in this Region in many of the areas addressed by this plan. From holding workshops to help homeowners install rain barrels to organizing forums for landowners to learn about important topics such as hydraulic fracturing and the rules of conservation easements, FOR is a true asset to sustainability efforts in this Region.

BARRIERS AND ENABLERS

BARRIERS

Political Climate

Skepticism remains high in Virginia about the causes of global climate change, even as the state begins to see the effects of this phenomenon. CLEAR looks forward to developing common ground among all interest groups within the George Washington Region. Its constituency is broad, and believes that protecting our environment helps strengthen our economy and protect property.

Traffic

As the Region begins to discuss ways to lower greenhouse-gas emissions, one major engine of our economy stands to complicate that. Interstate 95 brings a significant amount of people and commerce through this Region on a daily basis. Many of our own residents depend on this road to carry them to the jobs they need to support their households. This significant amount of vehicle traffic through our Region, which supports businesses from truck stops to restaurants to tourist attractions, will make it harder to reduce our greenhouse-gas emissions.

Governing structure

The George Washington Region is made up of five local governments, all with diverse political makeups. Regionalism in Virginia has proven challenging in many matters, and our Region has had its share of disagreements over road priorities and other issues. The effectiveness of this plan depends on building awareness of the risks to come and finding common ground to move forward.

Lack of cohesion

Many bodies within the Region are already working hard on items related to some of the goals outlined in this report. However, a lack of knowledge of what everyone is already doing sometimes hampers new efforts. CLEAR will seek to unite the diverse groups working within this Region.

ENABLERS

Strong support for property rights

Many of the goals in this report aim to protect private property from flooding, natural disaster or sustained resource shortages. This is an area where parties from all parts of the political spectrum can find common ground.

Support for measures that save money

Many of the goals in this report would result in cost savings to homeowners, businesses and/or taxpayers. Whether through lowering energy or water use, simplifying landscape maintenance or minimizing damage from storms, we hope the message of saving money and using our resources wisely is one this Region can rally behind.

Economy and jobs

Our Region's economy has withstood the recession much better than many others around the state, and that strength is an asset to build on. We must use the talent and knowledge we already have here in the George Washington Region to find ways to create new green jobs here, and to allow residents to telecommute to employers that remain based outside of the Region.

Existing green infrastructure

Already, significant progress has been made to strengthen the green infrastructure of the George Washington Region. In 2006, the Fredericksburg City Council approved a permanent conservation

easement on 4,232 acres running 25 miles upstream on the Rappahannock and Rapidan rivers. The Spotsylvania Greenways Initiative, Fredericksburg Pathways Partners and Friends of the Dahlgren Railroad Heritage Trail have provided many volunteer hours toward expanding the region's system of greenways. Many private landowners and groups such as the Central Virginia Battlefields Trust have used conservation easements and other mechanisms to protect open spaces in this Region. These are efforts to build on moving forward.

Student population

The University of Mary Washington and Germanna Community College bring to the Region a wealth of students and faculty with knowledge and energy to help find solutions to these problems. Through independent studies, service projects and other collaborations, the Region stands to benefit greatly from the contributions of students and faculty to the items laid out in this plan.

CLEAR GOALS AND ACTIONS

Here you will find the goals identified by participants in the five groups at the November 2013 CLEAR planning meeting, and specific action steps toward achieving these goals. These steps are meant to lay a solid foundation during the first year after this report’s publication, with the intention of setting more ambitious goals for 2020 and building on those actions in the years to come.

CLIMATE: COMMUNITY RESILIENCE

GOAL: Increase awareness of the challenges ahead, and build broad-based engagement and political will to take concrete steps toward resilience within the George Washington Region. Ensure that all communications emphasize the economic, social and cultural benefits derived from building a sustainable community. Emphasize the importance of cooperation among localities and different sectors of the community.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Establish a website for the CLEAR effort, along with Facebook, Twitter and other appropriate social media presences.	Up-to-date website established and promoted, at least 1,000 social media followers across all networks. Develop a logo and brand identity for CLEAR, possibly with input from local students, and use it across all platforms.	CLEAR working group, with support from University of Mary Washington College of Arts and Sciences		
Highlight the individuals and entities that are already making tangible	Pitch three stories about “green” efforts to The Free Lance-Star or other regional media	University of Mary Washington College of Arts and Sciences		

contributions to the region’s sustainability. Explore the possibility of starting a monthly “green” column in local mass media outlets.

outlet. Explore the use of traditional advertising, cable access and creating new platforms to promote these stories.

Start “CLEAR and Simple,” an educational campaign targeting the K-12 community that will introduce children to the importance of sustainability and help them to adopt sustainable practices in their day-to-day lives from an early age.

Establish a working group with representatives from every school and school system in the region. Identify a sustainability-related need within these schools that CLEAR can help with within the first year.

University of Mary Washington College of Education, UMW Center for Honor, Leadership, and Service

GOAL: Improve the ability of the people, assets and infrastructure within the George Washington Region to withstand and adapt to slow-onset stresses and long-term changes coming as a result of a changing climate. Create a safety net for the most vulnerable populations.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Take inventory of existing efforts and plans focused on sustainability within the region. Create an online repository of these resources.	Establish a portion of the CLEAR Website as a repository for these efforts.	Community Resilience working group, led by Gail Dunn, chief sustainability officer at Marstel-Day		

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Monitor the development of climate data at a more local level from the World Climate Research Programme and find out how to get the best data on future climate impacts for the region.	Establish regular contact with UMW faculty and other experts in climate data to stay on top of these efforts. Report any updates on the CLEAR website and through local media.	University of Mary Washington faculty and students
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Create a regional “Green Resource Map” listing green-living options, including recycling facilities, businesses that allow consumers to reuse goods, open spaces, rain gardens, alternative energy projects, etc.	Engage UMW students to help with research and design; produce and distribute map. Use map created by Albermarle County as an example.	University of Mary Washington faculty and students
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PARTNERS:

Virginia Cooperative Extension

Public and private schools

Central Rappahannock Regional Library

University of Mary Washington students and faculty, Germanna Community College students and faculty

Nonprofits, including Friends of the Rappahannock, 4-H, etc.

The Free Lance-Star

CLIMATE: EMISSIONS AND MOBILITY

GOAL: Reduce community-based greenhouse-gas emissions within the George Washington Region.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Perform a regional greenhouse-gas emissions inventory to set a baseline.	Obtain support from all area localities and begin inventory. Use tools available from ICLEI-USA Local Governments for Sustainability.	Fredericksburg Mayor Mary Katherine Greenlaw		
Engage local elected officials to build in public policy incentives for increasing the use of renewable energy by businesses, contractors, residents and government agencies.	Enact at least one such incentive in each regional locality.	George Washington Regional Commission		
Encourage all builders of new structures to meet LEED standards; write this into all local economic incentive programs.	Increase percentage of new construction projects meeting LEED standards, find opportunities to encourage this in public policy.	Regional Industrial/Economic Development Authorities and departments of economic development.		
Educate homeowners and builders about the cost benefits of highly energy efficient homes, as well as their potential to reduce greenhouse gas emissions.	Include a “net zero energy home” and/or a “passive home” on the 2015 Fredericksburg Area Builders Association Parade of Homes	Atlantic Builders		

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Start a consumer-oriented outreach campaign to give homeowners and individuals some basic tools they can use to cut their energy consumption on a daily basis.	Promote the use of clotheslines, teach consumers how to evaluate the energy efficiency of light bulbs and appliances and offer tips for making sure homes are well- insulated through electronic and traditional media.	Make this part of overall CLEAR marketing and communications efforts
Promote the use of electric and hybrid cars through demonstration and “ZIP-car” inspired rental programs.	Establish a traveling demonstration project that can showcase electric cars and how they plug in at public events.	Nan Rollison

GOAL: Reduce the average distance driven per resident.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Conduct research to determine average distance driven per resident in the Region.	Publish research and set a specific goal for reducing this number. (Current numbers for Fredericksburg, Stafford and Spotsylvania have already been obtained from	University of Mary Washington faculty and students, working with VDOT and FAMPO		

VDOT.)		
Encourage development patterns that put basic needs within walking and biking distance of homes.	Make this part of all regional planning discussions; engage builders and Planning Commissions.	University of Mary Washington students and faculty
Create and/or relocate desirable jobs from areas our residents commute to into the Fredericksburg region. Increase ability to telecommute.	Encourage and support efforts already ongoing by Fredericksburg Regional Chamber of Commerce and economic development community.	University of Mary Washington Center for Economic Development

PARTNERS:

- Fredericksburg Area Metropolitan Planning Organization
- Virginia Department of Transportation
- Commonwealth Transportation Board
- Fredericksburg Regional Alliance
- Fredericksburg Regional Chamber of Commerce
- Local government Planning Commissions and planning departments
- Regional trails organizations

ENVIRONMENT: SOIL AND WATER

GOAL: Reduce water usage, which conserves water resources and reduces the need to spend energy treating water.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Make water	Include practical	Steve Hubble,		

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conservation a component of all CLEAR public education efforts.	water-use tips in CLEAR and Simple, CLEAR Climate Partners and social and traditional media campaigns.	Stafford County Assistant Director of Public Works
Educate the public on the usefulness and benefit of rain barrels and set a goal of increasing their use.	Put 100 new rain barrels into use throughout the region by 2015.	Friends of the Rappahannock, working with student volunteers
Encourage hotels to wash linens per guest, not per day, and restaurants to serve water only upon request.	Find out who is already doing this and encourage others to join. Promote those who adopt these practices, possibly as part of CLEAR Climate Partners	Nan Rollison
Encourage regional cooperation on water planning, sourcing and infrastructure, and ensure that regional utilities encourage conservation with billing structures and other means.	Take inventory of conservation incentives and information currently in place among all area utilities. Help utilities provide tiered billing, water-use comparison charts and/or conservation tips with water bills. Identify new opportunities for regional cooperation.	Steve Hubble, Stafford County Assistant Director of Public Works

GOAL: Shift a percentage of the existing developed landscape from traditional green lawns and impervious paved surfaces to native plantings, rain gardens, pervious pavement and other “green” landscaping.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Inventory and promote all incentives for homeowners, developers, builders and business owners to implement green landscaping.	Distribute information on these incentives.	Atlantic Builders, Soil and Water Conservation District representatives		
Educate the public about the benefits of using drought-tolerant landscaping through demonstration projects, and try to shift the idea of what landscaping is “supposed to look like.”	Convert 10,000 square feet of traditional landscaping to “green” landscaping and promote it.	Soil and Water Conservation District representatives		
Encourage large stewards of open space to use Bay-friendly practices, i.e., parks departments don’t have to mow every square inch of land, farmers can use crop rotation, etc.	Identify and aid three specific instances of large landowners shifting to greener land-management practices.	Soil and Water Conservation District representatives		
Local governments can set an example by converting green lawns to native plantings and other “zero-scaping” that	Have two large county or city government facilities convert traditional lawns to native plantings or	Soil and Water Conservation District, Anne Little and others who are knowledgeable in native plantings		70 percent of local government facility lawns in the George Washington Region converted to native or “zero-scape”

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requires less or no water and maintenance.	zeroscaping and publicize these actions, emphasizing the savings in both natural resources and taxpayer dollars.	designs. 50 percent for the University of Mary Washington.
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GOAL: Understand and anticipate threats to the quality of the region’s water supply.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Monitor state and local discussions about hydraulic fracturing, or “fracking,” on land in the George Washington Region, to formulate a list of best practices to help local governments get ahead of this issue, educate the public and protect natural resources.	Establish a list of the risks and returns, and communicate a recommendation to area legislators, landowners and boards of supervisors on how to proceed.	Friends of the Rappahannock, King George County Supervisor Ruby Brabo		

PARTNERS

Public utilities and boards of supervisors and city councils

Professional landscaping community

Department of Conservation and Recreation

Virginia Outdoors Foundation

Friends of the Rappahannock

Developers

Homebuilders

Building Permit Offices

Fredericksburg Area Builders Association

Soil and Water Conservation Districts

Geography and Environmental Science students at UMW

ENVIRONMENT: RIVER, OPEN SPACE AND CULTURE

GOAL: Protect the rivers and water quality in the George Washington Region through management of landscapes and runoffs on a small- and large-scale basis. Provide visible, tangible lessons about what people need to prepare for and what they can do.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Support trails and greenways throughout the region. Use trails as a community outreach tool.	Install signs along trails to educate users about watershed issues. Stage demonstration projects along trails to give people tangible ideas they can implement on their own properties.	Fredericksburg Pathways Partners, Spotsylvania Greenways Initiative, Friends of the Dahlgren Railroad Heritage Trail		
Map out a new high-water mark and physically indicate it in relation to where it was in the past and where it is predicted to be in the future.	Identify the best location along the Fredericksburg riverfront for this project. Acquire data and install water mark.	Friends of the Rappahannock		

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<p>Follow up on the George Washington Regional Commission Green Infrastructure Plan’s recommendation to restore the regional tree canopy.</p>	<p>Increase the regional tree canopy by 5 percent, or approximately 51.5 sq. miles, with priority given to infilling gaps in riparian buffers and areas that aid water quality protection.</p>	<p>Tree Fredericksburg</p>
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GOAL: Increase the amount of open space in the George Washington Region. Follow up on related recommendations contained in the George Washington Regional Commission’s 2011 Green Infrastructure Plan.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Explore the possibility of creating a land trust within the George Washington Region to assist with easement acquisitions.	Work with GWRC Green Infrastructure plan participants to determine the viability of this idea and/or move this forward.	George Washington Regional Commission		
Increase the amount of land under conservation easement by 15,000 acres by 2020.	Identify priority properties, including those of cultural significance, and establish relationships with property owners. Ask developers to identify portions of their land that can be set aside for open space and conservation or connected to existing greenways	Friends of the Rappahannock, Civil War Trust, Virginia Outdoors Foundation		

when they apply for permits.

Improve data available to allow planners to improve environmental planning, per GWRC Green Infrastructure recommendation.	Work with GWRC to create a 1-meter (or better) classified land cover data layer that could better define the region's green and gray infrastructure. Seek grant opportunities to do this.	George Washington Regional Commission
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GOAL: Preserve and protect important historic and cultural resources in the region, such as natural vistas, battlefields, architecture and experiences.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Support and promote the work of the region's many historic preservation groups to identify and aid sites in need of preservation.	Include renovations and protection of valued sites in stories promoted to the press as part of overall CLEAR marketing plan; find ways to partner with historic preservation groups.	Historic Fredericksburg Foundation Inc., Central Virginia Battlefields Trust		
Preserve experiences that are considered part of the way of life in the George Washington Region.	Identify key experiences, such as fishing in the Rappahannock, pick-your-own produce opportunities, enjoying certain produce in certain months, etc., that	The Farmers Market.Co		

could be at risk because of climate change or destruction of natural infrastructure.

PARTNERS

- Friends of the Rappahannock
- Virginia Outdoors Foundation
- Virginia Department of Game and Inland Fisheries
- The Nature Conservancy
- Local elected governing boards
- Targeted landowners
- Historic Fredericksburg Foundation Inc.
- Central Virginia Battlefields Trust
- UMW geography, geology and environmental science students

ENVIRONMENT: WASTE

GOAL: Reduce the amount of community-based waste flowing into regional landfills.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Expand composting efforts on the individual and institutional levels.	Better publicize existing resources for composting education; establish a handful of community composting sites.	Rappahannock Regional Solid Waste Management Board, with local Clean and Green commissions		
Investigate the benefits of a food	Identify interested homeowners	University of Mary Washington		

scraps collection program at a hyper-local level.	associations who could set up pilot programs with their waste collectors.	students and faculty
Improve recycling rates across all regional localities to 50 percent.	Examine best practices from each locality, identify possible ways to replicate successes, find markets for more recyclables, educate residents and businesses.	Regional solid waste boards; Rappahannock Goodwill Industries

READINESS: EMERGENCY PREPAREDNESS

GOAL: Make the George Washington Region as prepared as possible to respond to and recover from natural disasters that will be coming with higher frequency and intensity due to a changing climate. Coordinate planning across all regional emergency response entities and optimize the use of regional resources.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Publish a report on risks and potential impacts that exist now, and those that can be expected in the next decade because of climate change. Target audience is both the public at large and regional emergency response agencies.	Identify grant funding for such a report. Develop an outline and a list of data needed. Bring University faculty, students and appropriate community partners into a working group.	University of Mary Washington faculty and students		
Work with regional and state emergency response agencies to examine emergency plans and	Gather all regional emergency response plans and identify redundancies or missing links. Work	University of Mary Washington faculty and students to engage regional emergency response		

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infrastructure with emergency community already in place, and response community identify resources to prioritize these needed to speed needs and identify at recovery and to least one that CLEAR make the region as can help with self-sufficient as immediately. possible.

GOAL: Identify opportunities to prevent damage, disruption and loss of life and property from floods, hurricanes, storms, extreme temperature events and other meteorological and climatic threats the region can expect. Act on these opportunities.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Promote a common understanding of where to go for information in emergencies.	Use CLEAR communications plan to promote regional emergency alert services and to boost subscriptions to text, e-mail and other mobile alerts. Promote local media that broadcast relevant information.	University of Mary Washington students and faculty, working with emergency services Public Information Officers		
Establish widespread understanding of where to go for help in an emergency.	Publicize information about emergency shelter locations. Plan and schedule regional preparedness drills on the institutional and individual levels.	University of Mary Washington students and faculty, working with emergency response agencies		
Identify and promote the needs of the most	Interview advocates for the elderly, disabled, mentally	Emergency Preparedness		

vulnerable populations to those in a position to help.	ill and hospital and health department administrators about needs. Organize this information into an actionable document.	working group
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PARTNERS:

- American Red Cross
- Regional emergency services agencies
- Regional press, radio and Web outlets
- Federal Emergency Management Agency
- Virginia Department of Emergency Management
- Schools
- Hospitals
- Health Department
- Large employers and large retailers
- FREDericksburg Regional Transit
- University students

READINESS: ECONOMIC DEVELOPMENT

GOAL: Work toward business growth with environmental sustainability to achieve better quality of life and to protect the future of the region.

Action	Progress goal for 2015	Who is the leader?	Achieved?	2020 Goal
Host a series of focus groups to identify the challenges and opportunities to	Identify participants among economic development, environmental and government fields.	Fredericksburg Regional Chamber of Commerce		

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align economic development an environmental goals.	Identify specific, practical goals and structure for these groups. Schedule focus groups.	
Partner with economic development entities and commercial real estate community to add community resilience to the list of selling points promoted to prospects, and to identify opportunities to grow green jobs within the region.	Create a handout for this audience that explains the value of resilience. Identify three specific strategies for attracting green jobs and employers.	Fredericksburg Regional Chamber of Commerce
Create a "CLEAR Climate Partners program for businesses and make it highly visible within the business community through window decals and other recognition.	Produce and distribute a concise packet of information that communicates why sustainability is in businesses' economic interests. Emphasize practices that can improve the bottom line and include practical checklists to help them think through their impacts on regional resources. Recognize those who act.	Friends of the Rappahannock, Fredericksburg Regional Chamber of Commerce

PARTNERS

Fredericksburg Regional Chamber of Commerce

Fredericksburg Regional Alliance

Local economic development offices

Friends of the Rappahannock

Building permit offices, business license offices and commissioners of the revenue

Commercial Real Estate community

UMW and GCC business students

A HISTORY OF THE CLEAR PLANNING EFFORT

December 2011 University of Mary Washington President Richard V. Hurley, Dean Richard Finkelstein, Marstel-Day CEO Rebecca Rubin and Lt. Gen. John F. Regni (Commander and Superintendent of the U.S. Air Force Academy and member of Marstel-Day Board of Advisors) meet to discuss coordination of a regional plan for resilience and resource protection.

January 2012: Discussion begins between UMW and Marstel-Day about building an environmental action plan for the George Washington Region.

March 2012: Fredericksburg Regional Chamber of Commerce President Susan Spears joins discussion group. Later on, CLEAR briefs the Chamber's Green Business Advisory Committee.

April 2012: Fredericksburg Mayor Tom Tomzak signs U.S. Conference of Mayors Climate Protection Agreement. First-draft prospectus outlining the process for developing a Climate and Environmental Action plan for the George Washington Region is created.

May 2012: CLEAR holds a small focus group of about 20 community leaders at UMW's Jepson Alumni Executive Center and begins to build support among stakeholders.

July 2012: CLEAR receives financial support from PNC Foundation. List of CLEAR stakeholders grows to over 90 corporations, not-for-profit groups, local and state agencies, and individuals.

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January 2013: Community forum held at UMW with 35 community leaders in attendance to identify regional concerns about environmental degradation, crisis planning, preservation of regional resources and economic and environmental resilience.

April 2013: Fredericksburg Mayor Mary Katherine Greenlaw signs U.S. Conference of Mayors Climate Protection Agreement

May-June 2013: UMW President Hurley's Regional Economic Development Leadership group aligns CLEAR with its regional economic planning efforts.

September 2013: The Free Lance-Star conducts a survey to assess citizens' perceptions about regional strengths and concerns about Rappahannock River, open space and environmental health. Results reveal concerns about infrastructure, threats to open spaces and the health of the river.

October 2013: CLEAR receives financial support from Virginia Environmental Endowment, Atlantic Builders, Marstel-Day LLC and the National Academy of Environmental Design.

November 2013 – More than 70 members of the community gather at UMW's Jepson Alumni Executive Center for a half-day planning charette, Participants offer dozens of ideas in the areas of community resilience, soil and water, river and open space, emergency preparedness and economic development.

January 2014 – CLEAR presents its first draft. Participants from the November meeting offer feedback on the plan's goals and action plan.

February – March 2014 – CLEAR plan is revised and edited, CLEAR establishes presences on Facebook and Twitter and prepares to release plan to the public.

April 2014 – CLEAR plan is released; CLEAR begins to engage the George Washington Region in discussions and actions to improve resilience and protect key assets. Initial planning groups are tasked with some of the first items from the plan's list of goals. CLEAR Facebook Page Established ([Fredericksburg Regional CLEAR](#)). FreeLance Star Viewpoints Series: a variety of authors write about preserving the area's natural heritage through Battlefield Preservation, Historic Preservation, and the original River Easement as concomitant aspects of preserving Fredericksburg natural heritage.

- [How the Rappahannock Was Saved](#) (John Tippett)
- [Planning for a Positive Future Requires Serious Questions](#) (Richard Finkelstein and Rebecca Rubin)
- [Why Save the Battlefields?](#) (Michael Stevens)
- [Saving the Area's Rich History](#) (Susan Pates)

April 30, 2014 – Marstel-Day, in partnership with CLEAR, hosts a talk on priority-setting for natural resource conservation with Jeff Danter of The Trust for Public Land.

May 2014 – City of Fredericksburg hires UMW summer intern to conduct a first-ever Greenhouse Gas Emissions Inventory for the city.

June 2014 – Initial CLEAR Plan draft inventory of environmental organizations in region is completed.

August 2014 – Initial results of Fredericksburg Greenhouse Gas Emissions Inventory published. Fredericksburg Regional Chamber of Commerce’s Fredtech/STEM Committee explores potential integration of environmental issues as a key focus area.

September 2014 – UMW announces Marstel-Day Award for Innovation in Environmental Stewardship that supports one winning applicant in developing a creative solution that addresses an environmental problem at the local, state, or national level.

October 2014 – The 3rd Annual Marstel-Day/Stafford Printing Green Frontier Award released. This award honors a company that demonstrates strong business practices focused on sustainability, resource conservation, and environmental awareness and education.

November 2014 – Marstel-Day, in partnership with CLEAR, hosts a Fall Energy Forum to discuss sustainable energy solutions. Small CLEAR Focus Group to be held afterwards.

December 2014 – Second annual Marstel-Day “Party with a Purpose” Green Gala benefit for Tree Fredericksburg and the National Wildlife Refuge Association.

Spring 2015 – CLEAR intends to host a series of public outreach events to report on progress and adjust goals for 2020.