



CLIMATE*Friendly* PARKS

Rock Creek Park Climate Action Plan



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Introduction

ROCK CREEK PARK

Rock Creek Park is both a specific place, a park established in 1890, and an administrative unit of the National Park Service (NPS). The park superintendent oversees the care of 99 park areas, spread across the northern portion of Washington D.C., from the Georgetown Historic District to Barnard Hill, including Rock Creek Park, Rock Creek and Potomac Parkway, Dumbarton Oaks Park, the Old Stone House, Meridian Hill Park, Glover-Archbold Park, and various Civil War fortifications.



Rock Creek Park was founded as one of the first federal parks. In its establishing legislation, Rock Creek was “dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States.” The park was to “provide for the preservation from injury or spoliation of all timber, animals, or curiosities within said park, and their retention in their natural condition, as nearly as possible.” It is easily accessible to the people of Washington D.C., offering a quiet and green place to walk, run, ride, or drive. Each year, more than two million people visit Rock Creek Park.

Rock Creek Park is a managed landscape reflecting our culture’s appreciation for natural surroundings. Visitors to the 122-year-old park are treated to a wealth of cultural history and natural beauty. Mills, civil war fortifications, memorials, and monuments are just some of the cultural sites found in the park. Natural features of Rock Creek Park include streams, flood plains, woodland, and meadows. The park supports a variety of native vegetation and provides a refuge for many animals that cannot normally flourish in the urban landscape. It also offers visitors many active and organized recreational opportunities, including ball fields, a golf course, tennis courts, riding stables, and open play areas.

ROCK CREEK PARK CLIMATE ACTION COMMITMENT

As the steward of the nation’s most valued public lands, the NPS has an obligation and opportunity to be a leader in protecting the environment. As a participant in the Climate Friendly Parks (CFP) program, Rock Creek Park belongs to a network of parks that are at the forefront of sustainability planning in national parks. By developing a greenhouse gas (GHG) inventory, setting an emissions reduction target, developing this climate action plan and committing to educate park staff and the public about climate change and mitigation efforts, the park is leading by example. In so doing, the park commits to reducing GHG emissions from park operations by 9 percent below 2009 levels by 2016 through the following actions:

1. Reduce electricity use in park buildings.
2. Expand the use of renewable energy sources.
3. Encourage the reduction of GHG emissions from visitors’ vehicles.

4. Upgrade the park's fleet and transportation infrastructure to reduce GHG emissions from mobile combustion.
5. Support a culture for staff to reduce GHG emissions caused by commuting.
6. Increase recycling and reduce solid waste.
7. Reduce wastewater.
8. Educate park staff on how to reduce GHG emissions.
9. Educate visitors about climate change risks and impacts and the steps that Rock Creek Park is taking to reduce GHG emissions.

National Oceanic and Atmospheric Administration (NOAA) records show sea levels in the Washington D.C. area have risen over a foot in the past one hundred years.

The Rock Creek Park Climate Action Plan serves to support and enhance existing initiatives such as the park's Environmental Management System (EMS) and the National Capital Region's (NCR) EMS. The park's EMS is a comprehensive management system that addresses all environmental programs at the park and provides the context for actions that reduce park GHG emissions. The NCR EMS addresses energy- and climate-related goals for all parks in the region and aligns with Executive Orders 13423 and 13514. This Climate Action Plan will be incorporated into the park's EMS. Additionally, the Climate Action Plan supports the park's General Management Plan.¹

THE CHALLENGE OF CLIMATE CHANGE

The atmosphere has a natural supply of gases that trap heat and keep the temperature of the Earth warm enough for life to survive. Such gases are known as greenhouse gases, or GHGs. However, an increase in the release of certain GHGs—including carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O)—through industrial processes and products has disturbed this balance. These gases can stay in the atmosphere for at least 50 years and are often present for many centuries. The increasing industrial release of GHGs, coupled with their long life, allow them to accumulate in the atmosphere, creating an extra-thick insulation layer around the Earth that causes an overall warming of the planet, commonly referred to as global warming. The term climate change describes the variable consequences of global warming over time.

According to the Intergovernmental Panel on Climate Change (IPCC), the leading international organization for the assessment of climate change, "continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century."² Rising global temperatures will further raise sea level and affect all aspects of the water cycle, including snow cover, mountain glaciers, timing of spring runoff, water temperature, ocean currents and upwelling, salinity levels of inland coastal waters, and aquatic life. Climate change is also expected to affect human health, alter crop production, modify animal habitats, and change many other features of our natural and managed environments.

¹ The purpose of this Climate Action Plan is to reduce park GHG emissions and is not intended to address park adaptation to climate change impacts.

² Intergovernmental Panel on Climate Change, Climate Change: 2007: Synthesis Report, page 45, www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

ROCK CREEK PARK AND CLIMATE CHANGE

Climate change presents significant risks and challenges to the NPS. In the mid-Atlantic region, which includes the Washington D.C., Virginia, Maryland, and West Virginia, sea level is rising one to two inches per decade. Moreover, due to geologic sediment compaction processes occurring in this region, land is sinking compared to the rest of the continent. The combination of sinking land and rising seas could result in impacts that greatly exceed those projected globally.³

Climate change, including increased temperatures and hydrologic changes, will likely alter the natural and manmade landscapes of Rock Creek Park, impacting a wide variety of its ecological, cultural, and recreational features. The following potential climate change impacts were considered while park staff developed this Climate Action Plan:

- Changes in growing seasons could affect vegetation.
- Changes in growing seasons and precipitation could lead to increased opportunities for invasive species establishment and proliferation.
- Unpredictable management needs for Rock Creek Park cultural and natural resources.
- Changes in visitation due to landscape, temperature and precipitation changes in the park and the greater D.C. area.

By measuring and tracking the reduction of GHG emissions from park-related activities, Rock Creek Park intends to minimize its contribution to climate change and the resulting impacts. Also, by demonstrating how the park is reducing GHG emissions, the park hopes to educate visitors about sustainable actions they can take to reduce their GHG footprints.

INVENTORY PROCESS

GHG inventories are performed by calculating the emissions produced by certain activities, such as electricity and fuel use. Data from NPS staff and concessioners was gathered and entered into the Climate Leadership in Parks (CLIP) tool. The CLIP tool was developed by the NPS Climate Friendly Parks program in association with the U.S. Environmental Protection Agency (EPA) to account for GHG emissions specific to national parks. The tool is designed to:

- Convert energy and resource use data into metric tons of CO₂ equivalent (MTCO₂e) - a single unit that normalizes the contributions of CO₂, N₂O, and CH₄.
- Educate park employees about the emissions inventory process through data gathering.
- Assist each park to identify strategies for emissions reductions, utilizing a workshop.
- Enable park personnel to track current and future progress towards emissions reduction goals.

To comply with federal guidance, the CLIP tool measures all the GHGs – carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) – and then automatically converts them into metric tons of CO₂ equivalent or MTCO₂e. The conversion of a GHG to MTCO₂e is based on the potential of that

³ Projections for global sea-level rise range from 15 to 40 inches. U.S. Climate Change Science Program. Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid Atlantic Region. Synthesis and Assessment Product 4.1. January 2009. Page 19. www.epa.gov/climatechange/effects/coastal/pdfs/SAP_4-1_SynthesisandAssessmentProduct.pdf

GHG to contribute to the greenhouse effect, or its global warming potential (GWP), relative to the potential of CO₂. CO₂ is given the GWP of 1. CH₄'s GWP is 21 times that of CO₂. N₂O's GWP is 310 times that of CO₂. Evaluating these gases using a standardized unit for GWP enables us to compare and contrast the impacts of gases in an inventory. The output of the CLIP tool is the park's emissions profile, which was used to prioritize GHG emissions reduction strategies.

Rock Creek Park staff gathered annual usage data (e.g., gallons of fuel used in a year) related to park operations, concessioner operations, and visitor travel within park boundaries for fiscal year (FY) 2009, the baseline GHG inventory year. Concessioner operations at Rock Creek Park include: Golf Course Specialists Incorporated (GCSI) at the Rock Creek Golf Course and Guest Services Incorporated (GSI) at the Horse Center, Tennis Center, and Thompson Boathouse. Employee commuting data was collected via survey in December 2011 and was included in the FY 2009 inventory as proxy data.⁴

Data categories include stationary combustion, mobile combustion, purchased electricity, solid waste, fertilizer use, refrigeration, and wastewater. These categories can be divided into direct and indirect GHG emissions. Scope 1 emissions are direct emissions from sources owned and operated by the park. This includes emissions produced when fuel is burned within park boundaries such as powering a park generator, using natural gas for heat, or fueling a park vehicle, and 'fugitive' emissions released from refrigeration and fertilizer use. Scope 2 emissions are indirect GHG emissions from park consumption of purchased electricity, heat or steam. Scope 3 emissions are all other indirect emissions such as emissions from concessioner operations, visitor vehicles, employee commuting, offsite wastewater treatment, and offsite waste disposal.

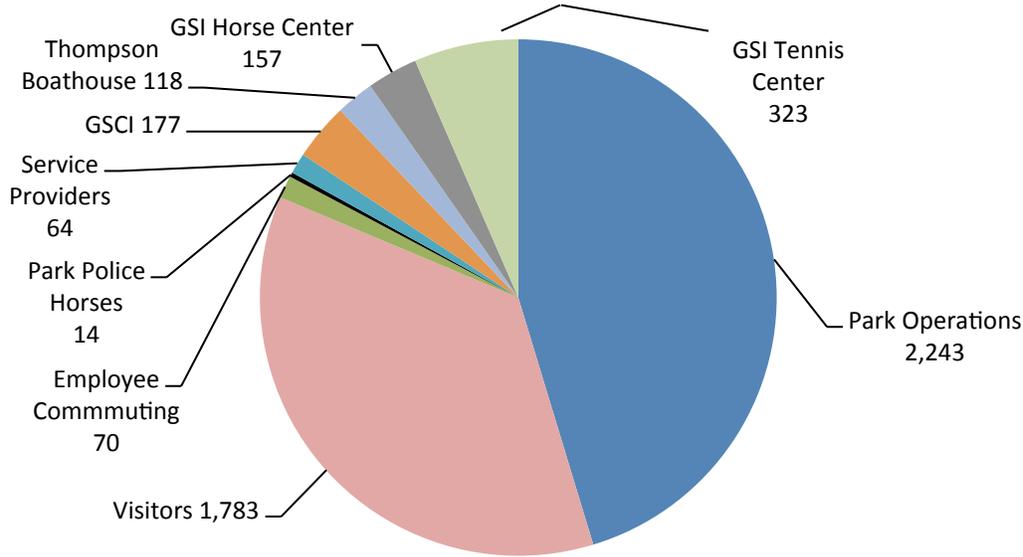
Park Emissions Profile

Total GHG emissions from park operations, concessioners, visitors, and employee commuting were estimated to be 4,950 MTCO₂e for FY 2009.⁵ Approximately 2,243 MTCO₂e or 45 percent are from park operations. Emissions from visitors were 1,783 MTCO₂e or 36 percent, and emissions from concessioners were 775 MTCO₂e or 16 percent. Emissions from service providers (outside contractors such as lawn and mowing contractors operating in the park) were relatively small at 64 MTCO₂e or 1 percent of total emissions. See Figure 1 on the following page, a pie chart of the park's GHG emissions profile.

⁴ It is unlikely that employee commuting data changed significantly from 2009 to 2011.

⁵ This total does not include GHG emissions from approximately 68 million miles driven by commuters on the Parkway annually.

FIGURE 1: FY 2009 ROCR TOTAL GHG EMISSIONS – 4,950 MTCO₂E



In order to target emissions reduction efforts, the park assessed emissions from park operations by source. Purchased electricity, was highest, at 1,775 MTCO₂e (79 percent of total park operations emissions). Mobile combustion is the second largest contributor, with 267 MTCO₂e (12 percent of park operations emissions). Mobile combustion includes transportation with the park’s vehicle fleet, as well as other activities performed by park staff (e.g., mowing, landscaping). Stationary combustion of natural gas produced an estimated 120 MTCO₂e (5 percent of emissions from park operations). Solid waste disposal produced 61 MTCO₂e (3 percent), while refrigerant use contributed 18 MTCO₂e (less than 1 percent). The park does not produce any emissions from fertilizer application and only 1 MTCO₂e from wastewater treatment. See Figure 2 for a breakdown of park operations emissions in MTCO₂e. Note that Figure 2 does not include employee commuting.

FIGURE 2: FY 2009 ROCK CREEK PARK OPERATIONS GHG EMISSIONS BY SOURCE – 2,243 MTCO₂E

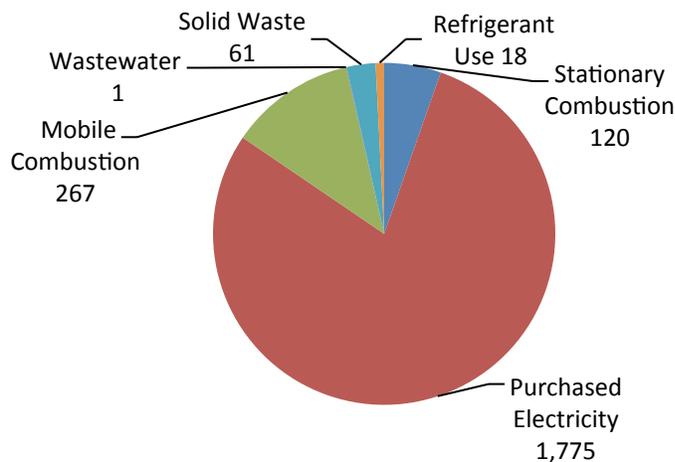
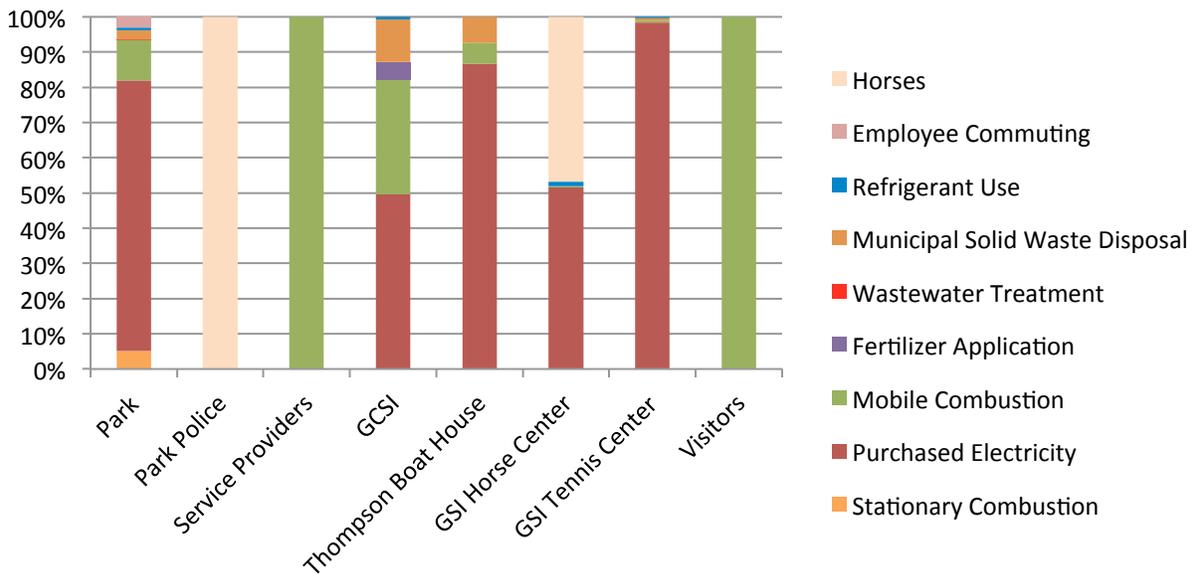


Figure 3, below, shows emissions profiles for groups shown in Figure 1 (e.g., park, concessioners, and visitors). Each emissions profile aligns with its group's activities. As noted above, most emissions from park operations are from purchased electricity. Emissions from visitor activities at Rock Creek Park are entirely from mobile combustion of fuels for transportation inside the park. Other emissions include those from horses at the GSI Horse Center and U.S. Park Police stables. Note that wastewater-related emissions were estimated based on average water use, and for the sake of simplicity, all such emissions are included under park operations.

FIGURE 3: FY 2009 ROCK CREEK GHG EMISSIONS BY SOURCE – PERCENT CONTRIBUTION



Strategies for Reducing Emissions

Rock Creek Park developed GHG reduction strategies and actions during the park's CFP workshop held February 2-3, 2012 at the park's Maintenance Yard in Washington, D.C. These strategies focus on reducing energy consumption, transportation emissions, water use, and waste generation, and increasing climate change education efforts. Rock Creek Park strategies to reduce emissions are based on emission reduction potential, cost-effectiveness, feasibility, co-benefits, local impact, and potential for rapid implementation.

STRATEGY 1: REDUCE GHG EMISSIONS FROM PARK ENERGY USE BY 9 PERCENT BELOW FY 2009 LEVELS BY 2016

The largest contributor of GHGs from park operations is purchased electricity, which produced 1,775 MTCO₂e in 2009. Therefore, Rock Creek Park will focus on actions to reduce energy consumption, including purchased electricity and stationary combustion. In addition to reducing overall GHG emissions, reducing energy consumption will reduce park expenses and thus save taxpayer money.

PROGRESS AS OF FEBRUARY 2012:

- Installed motion sensor lights in restrooms.
- Installed solar tubes in non-historic comfort stations and restrooms.
- Installed solar powered outdoor lighting at Fort Totten, the Nature Center, and the Maintenance Yard.
- Replaced some conventional light bulbs at the Nature Center with LED bulbs.
- Retrofitted Klinge Mansion and Old Stone House (two of the park's historic structures) with interior storm windows.
- Replaced 32 air conditioning units at the tennis stadium with high efficiency units.
- Replaced old water heaters with on-demand, tank-less water heaters.
- Advocated for inclusion of energy reduction goals in concessioner contracts.

ROCK CREEK PARK COMMITS TO THE FOLLOWING ACTIONS IN ORDER TO REDUCE PARK ENERGY USE:

1. Reduce electricity use in park buildings.
 - Pursue strategic replacement of incandescent light bulbs throughout the park.
 - Pursue energy savings performance contracts supported by the Federal Energy Management Program (FEMP).
 - Prioritize retrofit of Zoo tunnel lights, parking lot lights, and street lights.
 - Focus on interior lighting in park buildings as a second priority.
 - Commission energy audits for park facilities, especially historic structures.
 - Analyze energy usage from IT equipment.
 - Research DOI policy regarding leaving computers on at night.
 - Turn off other equipment, including monitors, printers, faxes, etc.
 - Provide power strips in offices so that devices can be collectively shut down when people leave.
 - Explore occupancy-sensor power strips that automatically shut down when no people are present.
 - Perform a building use analysis, and see if there are spaces that can be closed.
2. Expand the use of renewable energy sources.
 - Install sun tubes in non-historic park buildings where appropriate.
 - Evaluate demonstration solar water heaters at the Nature Center and consider installation of operational units around the park.
 - Expand the use of solar power for parking lot and street lighting.
 - Increase percentage of renewable energy purchased from utilities.
 - Consider hydroelectric power generation along Rock Creek.
 - Consider geothermal sources for new or upgraded energy systems in the park.

STRATEGY 2: REDUCE GHG EMISSIONS FROM TRANSPORTATION BY 5 PERCENT BELOW 2009 LEVELS BY 2016

The second largest contributor of GHGs from park operations is transportation, which produced 267 MTCO₂e in 2009. Therefore, taking action to reduce transportation-related emissions (e.g., less fuel use in vehicles and small equipment) can significantly reduce the park's GHG emissions.

PROGRESS AS OF FEBRUARY 2012:

- Expanded the park's fleet of hybrid and alternate fuel vehicles.
- Planned and/or implemented upgrades to the park's multi-use trails.

ROCK CREEK PARK COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM TRANSPORTATION:

1. Encourage the reduction of GHG emissions from visitors' vehicles.
 - Install more bike racks so that people can bike into the park and then tour on foot.
 - Research the expansion of bicycle sharing within the park.
 - Create and distribute a map that details public transportation options at Rock Creek Park and how to use them.
2. Upgrade park fleet and infrastructure to reduce emissions from mobile combustion.
 - Study fleet use at a macro level to identify opportunities to right-size the fleet.
 - Promote alternate fuel vehicles in the park with interpretive stickers.
 - Study the procurement of electric vehicles for traveling short distances in the park and the installation of solar-powered charging stations.
 - Consider using alternate transportation options (e.g., bicycles) for internal staff transportation.
 - Investigate the use of grazing animals to replace lawn mowers.
 - Research ways to source biodiesel, including partnerships with other government facilities.
 - Work with partners, including Clean Cities, and other parks to locate and utilize fueling stations that provide alternate fuels.
3. Support a culture for staff to reduce GHG emissions from driving.
 - Use education programs to encourage "eco-driving" habits among staff to reduce fuel use.
 - Encourage and facilitate conference calls and virtual meetings, including the installation of video conferencing.
 - Inform employees about the Metro subsidy and help them receive it, if desired.
 - Identify federal and state incentives for carpooling and communicate them to staff.
 - Implement a park telework policy.
 - Explore opportunities for shared office space so that NPS staff from various park units in the region can work closer to home or a meeting, subject to supervisor approval, on a given work day.

STRATEGY 3: REDUCE GHG EMISSIONS FROM WASTE BY 20 PERCENT BELOW 2009 LEVELS BY 2016

Disposal of solid waste produced 61 MTCO₂e in 2009. Although this is a relatively small contributor to overall emissions, there are opportunities to significantly reduce GHG emissions associated with this activity. The high volume of visitors and their associated trash, for example, is both a challenge and an opportunity for waste reduction.

PROGRESS AS OF FEBRUARY 2012:

- Added recycling containers in picnic areas.
- Encouraged use of water bottles instead of disposable cups during large races.
- All concessioners added recycling containers and encouraged recycling.
- Expanded recycling within park offices.
- Provided scanning as an alternative to copying for all park divisions.

ROCK CREEK PARK COMMITS TO THE FOLLOWING ACTIONS TO REDUCE PARK EMISSIONS FROM SOLID WASTE DISPOSAL:

1. Increase opportunities for recycling and reducing solid waste.
 - Conduct ISWAP or other waste analysis to identify best opportunities for reduction.
 - Determine if a “trash-free” program could work in certain park areas, and investigate the installation of solar compactors in others.
 - Install easy-refill faucets on water fountains to encourage the use of reusable, personal bottles.
 - Encourage concessioners to promote refillable water bottles.
 - Recycle waste from “stream team” projects rather than putting all materials in the trash.
 - Encourage groups at permitted events to reduce waste or to “pack it out” (e.g., certificates for eco-friendly events).
 - Expand the use of high efficiency hand dryers and paper towel free restrooms.
 - Evaluate printing needs and ways to reduce printing. For example, research DOI policy regarding what needs to be printed and communicate findings to staff.
 - Create a Rock Creek Park mobile phone application to compliment paper-based interpretive materials.
2. Reduce wastewater.
 - Analyze water use to identify reduction strategies.
 - Educate staff on best practices for reducing water use.
 - Expand the number of rain barrels and filters that capture stormwater runoff.
 - Install low-flow faucets and toilets, and motion-sensing spigots.
 - Consider obtaining a wash rack for maintenance vehicles that has a cistern to collect and recycle used water.
 - Evaluate water used for irrigation to identify opportunities for reduction.

STRATEGY 4: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Rock Creek Park is visited by approximately two million people annually, and is situated in a highly visible location within Washington, D.C. This presents a unique opportunity to educate the public about climate change and reducing GHG emissions. Similarly, there are opportunities to educate park staff and residents of surrounding communities.

PROGRESS AS OF FEBRUARY 2012:

- Installed signs in restrooms to explain water-saving fixtures.
- Verbally encouraged recycling while providing permits for events.
- Added planetarium programs that educate visitors about light pollution, alternatives for exterior lighting, and night-sky-friendly lights.
- Currently developing public outreach programs regarding water-wise gardens and rain barrels.
- GSI installed rain barrels at the Horse Center and at Thompson Boat Center, to collect and recycle water.

ROCK CREEK COMMITS TO THE FOLLOWING ACTIONS TO INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH WITH PARK STAFF, VISITORS, AND THE LOCAL COMMUNITY:

1. Educate park staff on how to reduce GHG emissions.
 - Hold internal training on “eco-driving” practices.
 - Train staff on best practices for water use.
 - Provide training on strategies for reducing energy use by computers and other IT equipment.
 - Promote the use of virtual meetings.
 - Train staff on protecting the park’s natural and cultural resources.
 - Provide sustainability updates at all staff meetings.
 - Hold regular EMS meetings.
2. Educate visitors about climate change risks and impacts and the actions that Rock Creek Park is taking to reduce GHG emissions.
 - Organize a forum on climate change at the Nature Center.
 - Explore hiring a CFP intern to coordinate outreach activities.
 - Consider developing interpretive materials that connect climate change to impacts within the park (e.g., invasive species).
 - Organize “trash-free” lunches for junior rangers.
 - Explore using leave-no-trace or “trash-free” language in permits for special events.
 - Increase signage for all climate friendly features of the park, including rain barrels, efficient appliances in bathrooms, recycled materials in playgrounds, etc.
 - Use special events as an opportunity to educate visitors about climate change and GHG emissions reduction at Rock Creek Park.
 - Create educational materials to communicate the park’s EMS to visitors.
 - Implement a climate change/GHG emissions reduction demonstration project for park staff and visitors.

Conclusion

Rock Creek Park has a unique opportunity to educate visitors and set an example for reducing GHG emissions in the NCR and entire NPS. By addressing emissions in a targeted, prioritized manner, the park can efficiently and effectively reduce its GHG emissions. Additionally, by sharing these strategies with park visitors, concessioners, and partners, Rock Creek Park will promote an awareness of climate change and promote actions to reduce GHG emissions on a broader scale.