



Climate Communication Toolkit & Preservation Tactics



Antietam National Battlefield
5831 Dunker Church Rd.
Sharpsburg, MD 21782



Learning About CC and How to Share It With the Park’s Audience

This toolkit is designed to help National Park Service rangers, specifically those serving in Antietam National Battlefield, engage visitors in conversation about climate change impacts and actions. This guide is meant to be a tool used to better understand how to communicate about climate change with various audiences. In a study by George Mason University and Yale University, it was suggested that the National Park Service is a trusted source of information about climate change. Therefore, parks like Antietam National Battlefield can be platforms to better inform visitors on how the resources they hold will be impacted by climate change.

IN THIS TOOLKIT WE WILL DESCRIBE:

- ▶ Climate change and the science behind it.
- ▶ How Antietam National Battlefield is and will be impacted by climate change now and in the future.

COMMUNICATION TOOLS:

- ▶ Importance of Language
- ▶ Global Warming’s Six Americas
- ▶ Using the Six Americas

Contents

▶	INTRODUCTION TO CLIMATE CHANGE	Pg. 5—6
▶	ANTIETAM IMPACTS	Pg. 7
▶	SPECIFIC IMPACTS IN THE PARK	Pg. 8
▶	CC IN COMMUNICATION	Pg. 9
▶	THE SIX AMERICAS	Pg. 10—11
▶	HOW TO COMMUNICATE WITH THE SIX AMERICAS	Pg. 12—14



Toolkit Contributors

4C — NPS INTERNS:
SABRINA ENDICOTT, KATIE
HILL, ERIN RUSEK



GEORGE MASON UNIVERSITY
CENTER for CLIMATE CHANGE
COMMUNICATION

**Cover Image: Maryland
Monument**

Image Left: Dunker Church
© NPS ANTIETAM

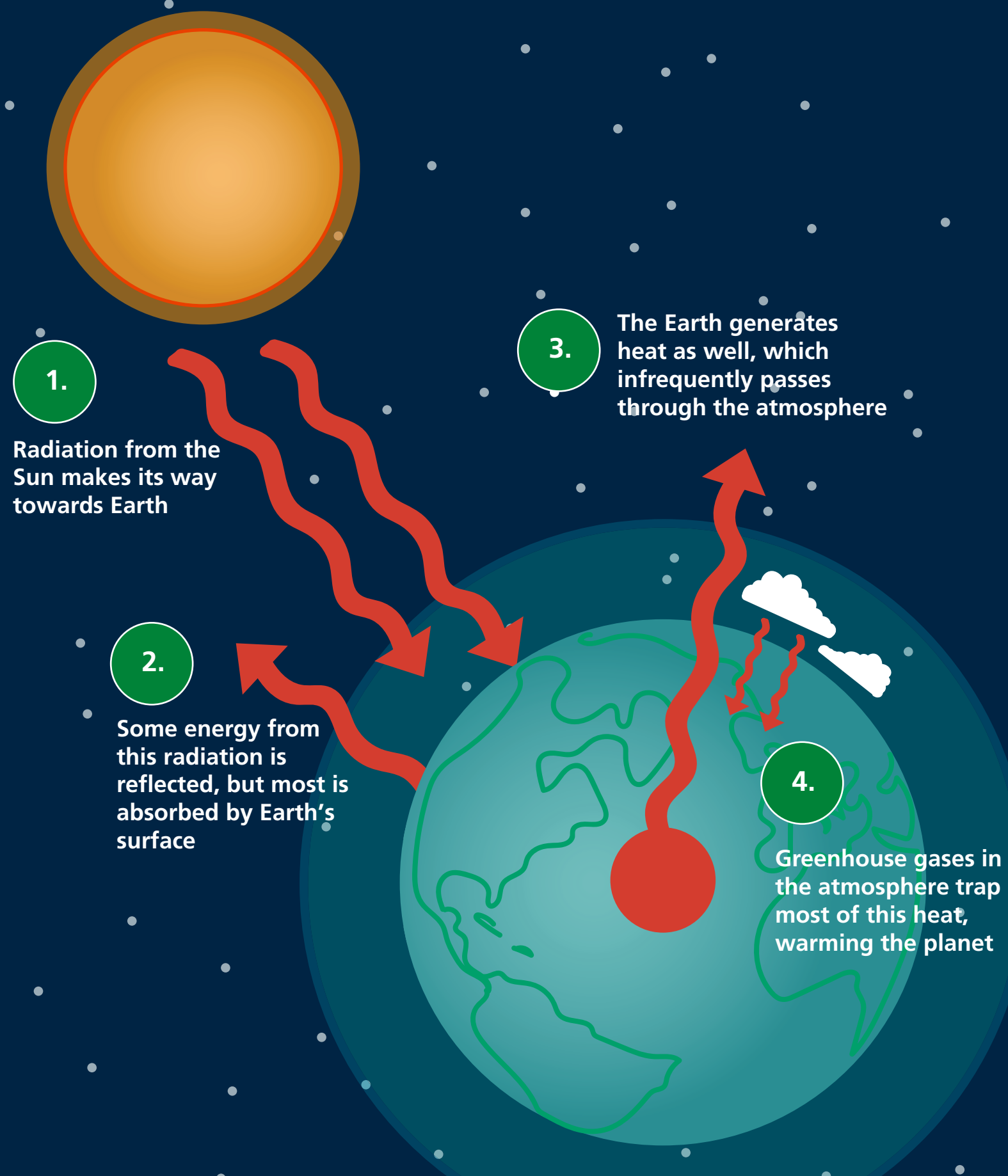
Introduction to Climate Change

Greenhouse gas (GHG) emissions that stem from a wide variety of behaviors are causing our planet's many natural processes to shift in time, place, and severity. Carbon dioxide, methane, and other greenhouse gases occur naturally in the world. But, by combusting large amounts of fossil fuels, which were contained in the earth as gas and oil, humans are releasing carbon and other greenhouse-causing molecules as gasses, causing a blanket-like build-up in the atmosphere.

Most solar radiation is absorbed by the Earth's surface, which warms it, but some is reflected back to space by Earth's surface and the atmosphere. The solar radiation that was absorbed by Earth's surface is re-emitted back towards space (also known as infrared radiation) and passes through the atmosphere. However, some of this infrared radiation is trapped by GHGs and re-emitted back towards Earth's surface. This is what further warms the Earth's surface and the lower atmosphere beyond the range plants and animals were adapted to. Each gas has a different global warming potential, a term used to describe how much of the sun's energy each gas can absorb when such energy is re-emitted from the Earth's surface. When functioning naturally, this process is what keeps the Earth and its atmosphere habitable; but too many of these gasses trap too much heat, causing the planet to warm at an unprecedented rate—which plants and animals do not have the time to adapt to.

Climate change refers to the alterations in the Earth's natural processes that this warming creates. Increased temperatures mean different things around the world. For some places, a warming climate means more severe droughts and lack of precipitation. When rain does occur in these areas, massive flooding is more likely. For places that are cooler, warming will decrease water held in ice, snow and glaciers. Glaciers, found both in the poles and elsewhere, are melting faster. As the spring melting process is compressed, more water is retained within the precipitation cycle. Sea levels rise when this once-stored fresh water is introduced into the oceans. Sea level rise will have detrimental effects on coastal environments and ecosystems. No matter which process is shifting in the face of climate change, social, economic and environmental impacts are unavoidable.

The Greenhouse Effect



Antietam Impacts

From 1895 to 2010, the mean annual temperature of our National Parks increased at double the rate of the mean annual temperature of the United States as a whole.

Even with a future reduction in emissions, the temperature at Antietam is expected to increase 1.7 degrees, and precipitation is expected to grow by 7%. If emissions continue to increase at the rate they are right now, the temperature will climb 5 degrees and precipitation will see 14% growth.

By 2040, 70% of Antietam will be highly vulnerable to climate change impacts, with 8% of the park lacking realistic opportunities for adaptation or mitigation, such as planting more trees or protecting areas from erosion.

Warming in the park will affect cultural preservation and the visitor’s experience. Thus, it is important to educate and inform visitors while also keeping mitigation and adaptation strategies in mind.

The Observation Tower
© NPS ANTIETAM



Specific Impacts in the Park

Current and Projected Changes:

Precipitation is expected to increase between 7 and 14 percent.

Temperature is expected to increase between 2 and 5 degrees celsius.

Longer growing season with spring arriving earlier

Pumping of more GHG into the atmosphere is increasing acid rain

Invasive species will survive milder winters instead of facing large die-off every year

Extreme weather events are expected to increase in severity and frequency

Impact on Park:

More extreme rainfall in concentrated time periods will increase flooding and erosion along Antietam Creek. Increased precipitation will also flood fields that have compacted soil.

More hot days means less snowfall and an increase in snow melt, contributing to more river water downstream. This will increase the erosion of riverbanks in the park and contribute to flooding. Additionally, warmer weather will impact the productivity of grasslands and crops due to increased competition from invasive species and changes in soil moisture.

Longer droughts and increased number of heat waves will stress plants, causing them to be less productive. The potential for a timing mismatch between pollinators and plant phenotypes will increase, seriously harming both the pollinators and the plants.

Acid rain will hurt the cultural and natural resources within the park.

Emerald Ash Borers, ticks, pine beetles, and other types of destructive invasive/ pest species will survive the winters as they continue to get warmer. They will have more reproductive success and their growing populations will cause more damage to the native tree and plant species.

Mature trees will suffer structural damage and seedlings and saplings on the forest floor will be exposed to more hot sunlight as a result of canopy loss, possibly limiting the amount of regeneration in forests. Other effects include flooding of Antietam Creek and structural damage to built cultural resources and historical natural resources like legacy trees.

Approaching Climate Change in Communication

Climate change vs global warming: The language we use to describe warming temperatures can have adverse effects on an audience’s understanding of such concepts. Climate change is a more all-encompassing term than global warming; it avoids the misleading idea that all areas are warming at the same rate or at same time. Climate change refers to the actual impacts from average global increase in temperatures, whereas global warming only refers to the average temperature increase itself. In reality, there are many effects of increased GHG emissions that alter ecosystems. Using “climate change” also addresses the idea that the climate changes naturally, allowing more room for discussion about human changes to the environment in addition to the natural warming of the planet. This makes “climate change” a more appropriate term for park staff to use when communicating with audiences.



Burnside Bridge over Antietam Creek
© NPS ANTETAM

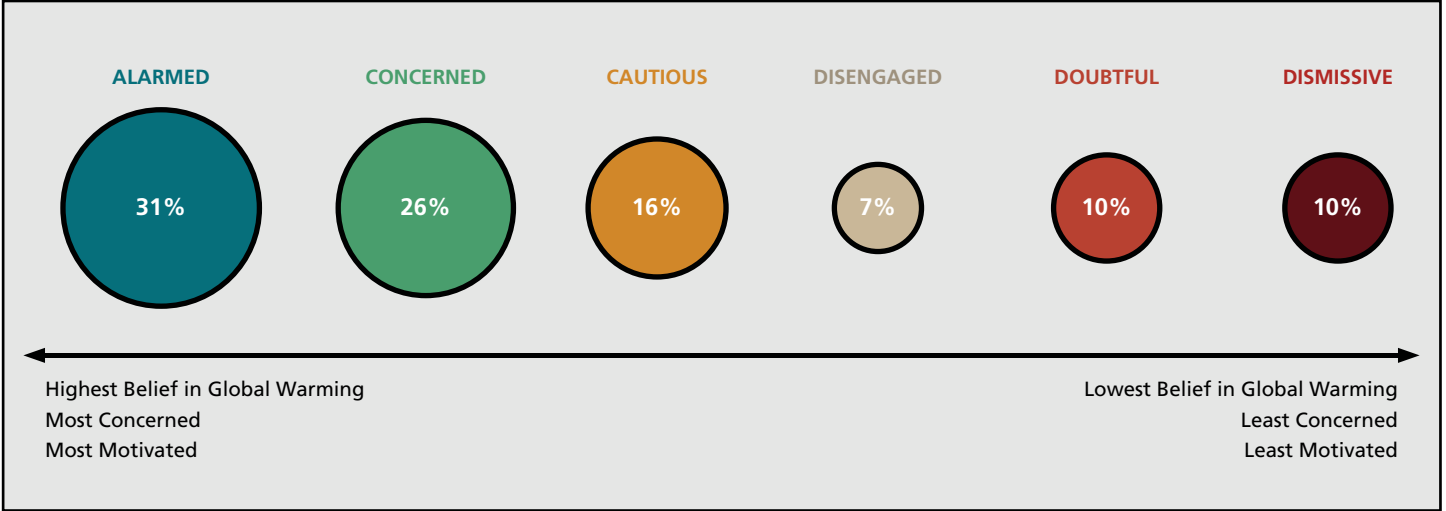
The Six Americas

It is practically impossible to size someone up and estimate whether they are dismissive, disengaged, or alarmed about climate change without first having a conversation with them. If the impacts of climate change on Antietam National Battlefield do eventually arise in conversation, it’s usually pretty easy to discern how that person feels based on their levels of engagement, passion, and concern.

When it comes to communicating climate issues, one size definitely does not fit all. Trying to tell a dismissive person about how warming temperatures and melting sea ice are contributing to global sea level rise would be about as successful as explaining to an extremely

alarmed person that eliminating agriculture or forcing everyone to become vegan probably wouldn’t work. People with different predisposed perceptions of issues receive new messages about those issues differently. This reinforces the importance of crafting the messages for the audience consuming them.

One of Antietam National Battlefield’s strengths is its opportunity to address the intersection between environmental history and cultural history, allowing it to appeal to visitors from almost any walk of life with almost any belief system. It also draws in those who possess any one of the six outlooks on the impending impacts of climate change.



The Six Americas

The **ALARMED** see climate change as a very real threat that is having immediate detrimental effects both close to home and far away. They have almost no need for further proof of climate change’s impacts, and are instead more interested in focusing their energy on taking action to mitigate such impacts. They are major consumers of climate news, and don’t foresee much possibility for any information changing their minds.

The **CONCERNED** recognize the detriment associated with climate change impacts, but are less urgent in their reactions to information. They are less likely to see the threats to their own lives, homes and families, but do not doubt that threats exist elsewhere. They might not consume as much media as the Alarmed, and thus might be more likely to change their minds on the sources and impacts of climate change. They are still largely confident that climate change is caused by humans and is an impending issue, though.

The **CAUTIOUS** spend very little time contemplating the veracity of climate change impacts and solutions. They are very likely to change their minds, but spend small amounts of energy on consuming news about climate science or the environment. They see climate change as a major risk to the future generations, but localizing the problem in time and space is difficult for them.

The **DISENGAGED** are the least interested or involved in consumption of all kinds of climate change messages and media. They don’t see climate change as an issue in need of their attention or national resources for further research. They overwhelmingly don’t think about climate change, and are some of the least likely to be following current events and national news in general. They largely believe that humans can solve any problems at hand.

The **DOUBTFUL**, despite what their categorization might imply, do not necessarily doubt that climate change is happening. What they tend to doubt instead is the human causation of climate change. They are relatively aware of current events, politics, and consume media, and they are confident in their opinions on the matter. They see very little risk to the United States and to their own families, but might believe in some risk to future generations.

The **DISMISSIVE** generally don’t believe that climate change is actually happening, and they tend to have the highest confidence in their viewpoint with the lowest likelihood to change their minds. They don’t believe the United States is at any risk, and they have very little belief in the scientific consensus. They consume a fair amount of political media and news about current events, but might also be consuming climate misinformation to reinforce their beliefs.

How to Communicate With the Six Americas

ALARMED COMMON QUESTIONS:

- ▶ What evidence proves climate change is really happening at this park?
- ▶ How do you know changes at the park are due to climatic changes?
- ▶ How do you know climatic changes are not just due to natural variation?

HELPFUL TIPS:

- ▶ Telling stories about local park impacts rather than causes will resonate best.
- ▶ Work to activate, not convince them. Quench their thirst for what they can do to help, empowering them to be part of the solution.
- ▶ Encourage more citizen engagement and provide tips for greener park visits, travel, and for home energy reduction behaviors.

IN THE PARK:

- ▶ There have been dramatic changes in climate in recent years. Two years ago the crop land was experiencing a very wet season, hurting the crops. Now, at the same time of year, they are experiencing drought conditions.

CONCERNED COMMON QUESTIONS:

- ▶ Do we still have time to reduce the effects of climate change here?
- ▶ How can we tell that climate change is mostly human-caused as opposed to natural variation?

HELPFUL TIPS:

- ▶ Focus on what the park is doing to minimize its contribution to climate change, and what it is doing to protect its natural and cultural resources.
- ▶ Show visitors the current and anticipated impacts of climate change on the park.
- ▶ Reference scientific findings when correcting misconceptions and to explain gaps in understanding.
- ▶ Guide tendencies towards environmentally conscious consumerism by giving examples of existing green and sustainable practices in the park.
- ▶ Connect the importance of action to the idea of providing a better future for present and future generations of their family.

IN THE PARK:

- ▶ To minimize climate impacts on agricultural land, farmers are planting cover crops. These crops help to add nutrients to the soil in between plantings and mitigate effects from erratic weather on the soil.
- ▶ The NPS is exploring mitigation strategies to handle the potential for future invasions of Emerald Ash Borers, primarily strategies that employ natural biocontrols of the invasive species.
- ▶ The Natural Resource Management staff are actively replanting and managing forested acres that have suffered from low tree regeneration in previous years in an attempt to improve canopy cover and overall forest ecosystem health.

CAUTIOUS COMMON QUESTIONS:

- ▶ Is climate change being felt in the park now? How do you know?
- ▶ Is climate change really mostly human-caused or is it just due to natural changes in the environment?

HELPFUL TIPS:

- ▶ Convey climate change is real, human caused, already harming people, and there is scientific consensus. (An effective way to phrase the consensus is: Based on the evidence, more than 97% of climate scientists have concluded that human-caused climate change is happening.)
- ▶ Use visual media and real examples in the park; gradually expand to other areas if possible.
- ▶ Build on their perceptions that energy conservation makes sense financially (cost-savings).
- ▶ Lead by example - explain what is being done in the park to conserve energy and how much money it saves. Demonstrate that these are positive, simple actions shared by many people like them.

IN THE PARK:

- ▶ The temperatures have been increasing within the park on a dramatic incline, one that is unprecedented in the natural cycle. It has caused severe droughts and flooding impacting the cultural resources like roads and structures and also the crop fields.
- ▶ Burnside Sycamore is struggling with erosion and potential structural damage to the root system due to flooding of the river from early spring snowmelt and increased precipitation during cold seasons, causing increased velocity in Antietam Creek.

DISENGAGED COMMON QUESTIONS:

- ▶ Overall, is climate change beneficial or harmful?
- ▶ Is climate change natural, human-caused, or both?
- ▶ How do you know climate change is real and/or happening? Can you see it at the park?

HELPFUL TIPS:

- ▶ Demonstrate how people similar to them are being harmed already, or will be harmed, and that climate change is a public health issue (this specific point may be important to include in discussions at parks adjacent to more highly vulnerable communities).
- ▶ Emphasize that the vast majority of scientists agree that climate change is real and human caused.
- ▶ Explore ways that we collectively, NPS and individuals, can meet this challenge through the opportunities to adapt to impacts and to reduce our carbon footprint.

IN THE PARK:

- ▶ You can see the thin numbers of seedlings and saplings in the park, making for poor forest regeneration.
- ▶ There is visible tunnelling and damage from the invasive Emerald Ash Borers on dead ash trees.
- ▶ Although it has been shown that warming could increase productivity of plant growth, this means for all plants, including invasive species. When they compete for resources with native crops, they become more tolerant of extreme weather conditions, hurting native crops. This is not beneficial to the landscape.

DOUBTFUL COMMON QUESTIONS:

- ▶ How do you know that human activities have more of an effect on Earth's climate than natural environmental variation?
- ▶ What are the causes of climate change?
- ▶ What evidence of climate change can you show me in the park?

HELPFUL TIPS:

- ▶ Start by establishing the consensus: Based on the evidence, more than 97% of climate scientists have concluded that human-caused climate change is happening.
- ▶ Don't attempt to persuade; instead correct misperceptions by presenting understandable scientific facts and avoid re-stating myths.
- ▶ Place emphasis on how conservation, and particularly energy conservation, can save money.
- ▶ When answering questions, try to use examples within the park(s).

IN THE PARK:

- ▶ Pollution in the atmosphere can create acid rain. This is highly acidic and will dissolve stones that are porous. You can see the effect on the gravestones within the park and how they are weathern from the acid rain.
- ▶ Climate change is caused by greenhouse gasses, which humans are pumping out. With conservation efforts and lessening our impact, we can help preserve places like Antietam National Battlefield.

DISMISSIVE COMMON QUESTIONS:

- ▶ What evidence proves climate change is really happening at this park?
- ▶ How do you know changes at the park are due to climatic changes?
- ▶ How do you know climatic changes are not just due to natural variation?

HELPFUL TIPS:

- ▶ Rather than trying to win an argument, remain polite when dealing with criticism because it may shape how receptive visitors around you evaluate your credibility.
- ▶ Support and encourage saving money through energy conservation.
- ▶ Remind them there are instances where we must act responsibly without being 100% certain.
- ▶ Provide concrete and real examples of climate change happening within the park(s).
- ▶ Promote a positive message by explaining the benefits of addressing climate change.
- ▶ It is okay to politely disengage from the conversation if mutual respect cannot be reached.

IN THE PARK:

- ▶ Forest regeneration in the National Capital Parks Area Region 1 is at 10% of what it should be for healthy ecosystems to be sustained
- ▶ Without proper forest regeneration, the quality of the air in the park is lowered, especially considering the increase in development occurring outside the park boundary, which is contributing to more air pollution.
- ▶ This means fresh air will continue to become less fresh in a place where it should be clean and healthy.