COMMUNITY CHANGE GRANTS
Environmental and Climate Justice
U.S. Environmental Protection Agency

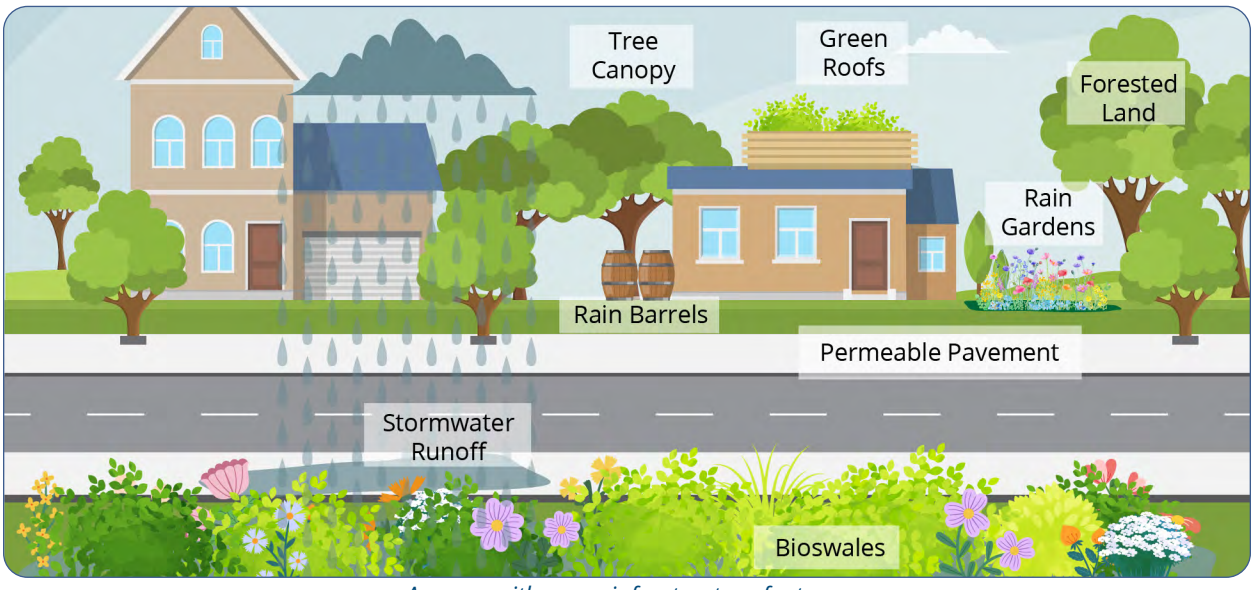
EnDyna

# Climate Action Strategy 1: Green Infrastructure and Nature-Based Solutions

## Green Infrastructure 101

Green infrastructure or nature-based solutions use plants and surfaces to help manage stormwater, rainwater, or melted snow. Green infrastructure can absorb, filter, and slow down stormwater runoff. This reduces the amount of trash, bacteria, and heavy metals that get into the environment and decreases erosion and flooding. Green infrastructure can even help cool local temperatures, stopping heat islands.

- **Bioswales:** Long, narrow, shallow, sunken channels with plants and/or mulch.
- **Permeable pavements:** Pavements made with materials that allow stormwater to soak through them.
- **Rain gardens:** Shallow, sunken planted areas that collect stormwater runoff.
- **Tree canopy:** The leaves, branches, and stems of trees that shade the ground. Protecting existing trees and planting new trees increases tree canopy.
- **Wetlands:** Types of ecosystems where water covers, or is near, the surface of the soil, seasonally or year-round.




*An area with green infrastructure features*

# Green Infrastructure and Nature-Based Solutions

## Green Infrastructure Solutions for Community Challenges

### Poor Water Quality

| Community Challenges | Possible Solutions |
|---|---|
| Stormwater runoff often contains trash, heavy metals, and other pollutants that can decrease the water quality of streams and lakes. High stormwater flows can sometimes result in sewage overflow.<br>• Lower water quality can harm human health.<br>• Lower water quality can also harm fish and other wildlife that live in or near water. | • Green infrastructure such as rain gardens and bioswales can help filter some pollutants from stormwater runoff. Plant roots absorb some of the pollutants.<br>• Green infrastructure can also decrease stormwater runoff, which can reduce sewage overflow and further improve water quality. |

### Flooding

| Community Challenges | Possible Solutions |
|---|---|
| Stormwater runoff is not absorbed by most roads, pavements and other gray infrastructure. It quickly drains to rivers and streams, which can cause flooding.<br>• Floods can cause injuries, damage to property, and loss of life.<br>• Members of disadvantaged communities have been shown to be more vulnerable to floods. They also sometimes recover more slowly from floods. | • Green infrastructure such as wetlands can help reduce flooding by storing water. One acre of wetland can store about a million gallons of water.<br>• EPA estimates that having 15% of an area's land as wetlands can reduce a flood's peak level by 60%.<br>• The benefits of protecting, restoring, or constructing wetland often outweigh the costs. |

# Green Infrastructure and Nature-Based Solutions

## Green Infrastructure Solutions for Community Challenges

### Heat Islands

| Community Challenges | Possible Solutions |
|---|---|
| Buildings and streets hold on to the sun's heat more than plants, causing heat islands.<br>• Residents of heat islands are more at risk of heat-related illnesses, some of which can cause death.<br>• Some disadvantaged neighborhoods have been shown to have higher temperatures than neighborhoods next to them. | • Planting trees to increase the tree canopy can help provide shade, which lowers temperatures.<br>• Concrete and asphalt absorb and store heat, increasing temperatures. Replacing them with plants is cooling.<br>• Trees and other plants also help cool the area by absorbing water and releasing it through their leaves.<br>• Trees grow slowly, so it can take years after they are planted to see some of the benefits. |

### Lack of Access to Parks and Green Spaces

| Community Challenges | Possible Solutions |
|---|---|
| Parks and other green spaces provide many economic, social, physical and health benefits to communities.<br>• Green infrastructure being installed in parks and other open spaces can increase these benefits.<br>• Some disadvantaged communities do not have access to well-maintained parks and green spaces. | • Building parks that have green infrastructure, such as bioswales, permeable pavements, wetlands, and tree canopy, can provide additional flood protection benefits to nearby communities.<br>• Climate benefits of new public parks include heat island reduction, flood mitigation, and increased access to recreation. |

Disclaimer: This document was created to help Community Change Grant applicants think through various potential solutions to the problems their community may be facing. All the listed "Community Challenges" and "Possible Solutions" are only examples. We did not attempt to list all possible challenges or solutions.

For further information on green infrastructure, see EPA's Green Infrastructure Program and the White House's Nature-Based Solutions Resource Guide.

For more information on the Green Infrastructure and Nature-Based Solutions Climate Action Strategy, read Section I.G and Appendices C and F of the Notice of Funding Opportunity (NOFO).

**For further questions regarding technical assistance, please contact EJ_TechAssist@epa.gov or call 1(800) 540-8123.**

**For questions regarding the Notice of Funding Opportunity (NOFO), please contact CCGP@epa.gov.**

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