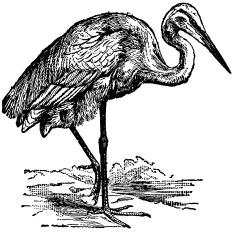# Core Module #3: Stormwater Management and Green Infrastructure

Employment Module

Photo Credit: Allison Palmer Jensen

Core Module #3:
Stormwater Management & Green Infrastructure
Employment Module

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Themes

1. Understanding storms, stormwater, and flood events.
2. Knowing where stormwater goes and its impacts to our environment and resources.
3. Exploring ideas to mitigate the harmful effects of stormwater runoff to the environment and communities.
4. Exploring Green Infrastructure Solutions, like "sponge cities."

Background

Communities across the country are experiencing damaging flooding. As a result of increases in storm intensity due to climate change, the problem is expected to get worse. Studies show that neighborhoods containing residents with lower incomes, racial and ethnic minorities, the elderly, and individuals with disabilities are disproportionately affected by flooding.[1] At the same time, we face water quality issues. Our streams and lakes have elevated levels of bacteria and other nutrients that cause issues like harmful algal blooms.

Polluted stormwater runoff is a major cause of both problems. This is the water that falls on hard surfaces like roofs, roads, and sidewalks and subsequently "runs off."[2] In doing so, it picks up unnoticed and oftentimes unintended "people pollution," such as vehicle waste (antifreeze), lawn treatment chemicals, road salt spread in the winter, and more.

That water all ends up in our streams and rivers, and, after cleaning, is ultimately our source of drinking water. The more polluted it is, the more difficult and expensive it becomes to treat it for our use. In addition, when it rains hard, that water has nowhere to go and floods our streets, homes, and businesses.

When water falls on undeveloped areas like fields and forests, much more of it is absorbed so there is less "runoff." In addition, water falling on natural surfaces gets cleansed as it soaks in, moves through soil, and is taken up by native plants and trees. "Green infrastructure" mimics this natural process by directing stormwater runoff from our hard surfaces to where it can be cleansed by soil and plants. This can be done in our urban areas by using "best management practices" like rain gardens and green roofs.

This module will provide information on how green infrastructure can be integrated into our communities as well as a description of pathways to employment for young people relating to this important work.

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1. John Fialka, "When Storms Hit Cities, Poor Areas Suffer Most," Scientific American (Scientific American, April 1, 2019), https://www.scientificamerican.com/article/when-storms-hit cities-poor-areas-suffer-most/.
2. Alvaro Sanchez Sanchez, Jeremy Hays, and Andrea Quinn, "Staying Green and Growing Jobs," American Rivers, April 2013, https://www.americanrivers.org/wp content/uploads/2016/05/staying-green-and-growing-jobs.pdf.

Values

Bringing green infrastructure into our communities offers benefits beyond reducing flooding and improving water quality.[3] Well maintained green spaces have been shown to offer many positives, including:

- Reducing the heat on city streets
- Reducing crime rates
- Improving mental health
- Increasing property values
- Providing habitat for birds, bees, butterflies, and other species

Since low-income communities and communities of color are more likely than other demographic groups to live in paved and developed areas and to experience more flooding, adding green infrastructure can make a significant positive impact.

Challenges

Community members may be more accustomed to the green space being maintained as a lawn and view rain gardens and other green infrastructure as "messy."

Since plants are an important element of green infrastructure, proper maintenance is vital. Weeds need to be removed and drainage grates cleared, for example. This is an opportunity as well as a challenge. Demand for workers who know how to maintain green infrastructure installations will grow along with its adoption.

Solutions

Community engagement and proper design and maintenance of the green infrastructure installations will build awareness and appreciation of the important role that plants and soil can play in managing flooding and protecting water quality. Educational signage where appropriate can also increase community acceptance.

Implementation

In New Jersey, new development that perturbs more than an acre of land or adds ¼ acre of impervious surface is required to manage stormwater runoff with green infrastructure. Redevelopment of a property is also a good time to add green infrastructure, particularly in neighborhoods where flooding occurs.

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3. Emily Gordon et al., "Water Works," Pacific Institute (Green for All, April 17, 2020), https://pacinst.org/.

Green infrastructure projects can be extremely large scale; an example would be a park that can double as a basin to capture and hold water during flooding. A project like this would probably be undertaken by the County or the City. However, small-scale residential solutions can also help to address flooding and water issues, such as basement flooding. These projects can be undertaken by municipal government, schools, and community groups working with one of the many organizations with expertise in this area like Isles, the Water Resources Program at Rutgers, or The Watershed Institute.[4]

Job Creation

Job opportunities related to green infrastructure installation include landscaping, plumbing, horticulture, construction, engineering, and paving.[5] Jobs relating to maintenance of green infrastructure include caring for plantings and ensuring proper function of GI technology.[6] The work can involve vacuuming pervious pavement and periodic replacement of paver blocks for pervious pavement. Additional work includes annual cleaning of cisterns, erosion repair, raking of rain gardens, and cleaning of inlets.

Training

A variety of programs exist to provide training and job skills for the green infrastructure field. These include:

- Rutgers Green Infrastructure Champions Program
- Trenton Climate Corps Program (Contact https://isles.org/ for information)
- Camden PowerCorps (for residents of Camden, NJ)
- Other training opportunities can be explored here.

4. "Wells of Opportunity: Training Residents and Prioritizing Local Hiring …," Jersey Water Works, November 2020, https://cms.jerseywaterworks.org/w
   -content/uploads/2020/11/Newark-Local-Hire-Report-November-2020.pdf.
5. "Green Jobs in Your Community," EPA (Environmental Protection Agency, July 14, 2022), https://www.epa.gov/G3/green-jobs-your-community.
6. Kevin Doyle, "Growing Jobs through Green Stormwater Infrastructure: The Philadelphia Experience," Jobs for the Future (JFF), June 23, 2016, https://www.jff.org/points-of
   view/growing-jobs-through-green-stormwater-infrastructure-philadelphia-experience/.

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Facilitation Questions:
1. Do you think green infrastructure would add value to your neighborhood?
2. How do you think your neighbors would react to having a rain garden or naturalized basin nearby?
3. Do you understand how green infrastructure can reduce flooding?
4. Do you understand how green infrastructure improves water quality?
5. What do you think some issues might be with adding green infrastructure to your neighborhood?
6. How could those issues be addressed?

Additional Resources:
- Watershed Institute: Exploring Green Infrastructure
- Water Risk & Equity Map: New Jersey Water Risk & Equity Map
- Documentary: Water Blues Green Solutions
- Short Video: Green Infrastructure
- Rutgers University: Green Infrastructure Guidance for Home, Work, and School