

# Peoria Stormwater Management: Multi-Purpose Innovation

Saneta deVuono-powell



Like 800 cities and municipalities across the country, the City of Peoria has a combined stormwater system (CSO) that allows the overflow of raw sewage to enter waterways during heavy rains or snowmelts. In the 1980s and 1990s, the city spent \$10 million to cut down on the overflow, but in 2006, the U.S. Environmental Protection Agency found that the city's combined sewer overflow still violated the federal Clean Water Act when runoff during heavy rains and snows flowed into waterways. The City of Peoria and the EPA entered into negotiations at that time and finally reached a tentative consent decree agreement in December 2020.

The last six years of the 15-year negotiation focused on how the EPA would treat the expansion of green infrastructure pilots. In 2015, Peoria's Innovation Team (i-team), which was launched by a Bloomberg Philanthropies i-teams Grant, began working with community members to identify pilot projects that would meet the needs of the community and address stormwater issues. The first pilot was a pedestrian-friendly green street designed to absorb rainfall.

The second project is the nation's first stormwater farm, which has transformed a city-owned vacant lot into a community space and urban farm that captures stormwater. The 1.5-acre Well Farm at Voris Field was engineered and contoured to optimize stormwater management and is fully instrumented to measure that optimization. Vegetables and flowers are grown in raised beds and sold at the Peoria Farmer's Market. The planted trees are hybrid poplars, a fast-growing species that absorbs large quantities of water and can ultimately be harvested for timber. The project's mix of green features, underground storage, and urban agriculture prevents more than a million gallons of stormwater from entering Peoria's combined sewer each year. It has also created almost 30 new jobs.

Peoria's green infrastructure pilot projects were developed with federal and private funds by a community partnership that included local nonprofits, local contractors, community members, city leadership, and project manager Greenprint Partners. The projects have been widely touted as successes, and Well Farm won the 2019 U.S. Water Prize.

However, the projects also were at the center of ongoing negotiations around the consent decree. While Peoria tried to get the EPA to approve its green solutions to the city's sewage problem, the EPA wanted the city to install pipes, tanks, and gutters to divert the overflow. City Manager Patrick Urich estimated that installing more bioswales and rain gardens to absorb and redirect stormwater would cost around \$109 million over the course of the 18-year consent decree, about a quarter of the estimated half billion-dollar cost of traditional grey water infrastructure.

Influenced by the successful pilots, the approved consent decree gives Peoria the flexibility to use innovative measures, including investments in green infrastructure, to achieve its performance criteria with the stipulation that it meet four interim milestones to show continued progress. The city has stated that it will move towards 100% reduction of combined sewage overflow by 2034 and intends to demonstrate the effectiveness of green infrastructure in meeting environmental standards.

*Flood waters overrun the Spirit of Peoria dock cresting at 25.1 feet  
Cover Photo: Holly Eitenmiller for Chronicle Media*



*Flooding in downtown Peoria, Illinois  
Photo Credit: Jay Harrod, The Nature Conservancy*

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## Financing

The Well Farm pilot cost \$2 million (\$1 million of which came from the USDA Conservation Innovation Grant program) but is estimated to have generated \$2.8 million in economic activity so far. The estimated overall cost of the stormwater infrastructure is estimated at \$200-250 million. The first \$15 million tranche will likely be funded through a revolving loan program offered by the Illinois EPA and revenue generated from a new combined stormwater fee paid by city residents. After the 18-year period of the consent decree, the city estimates that annual maintenance fees will come out to about \$3.5 million per year. Starting in 2023, Peoria's newly created stormwater utility will increase sewage rates to help cover costs, which has already caused some pushback. However, the city council unanimously voted to approve the consent decree.

## What made this work?

Well Farm gave Peoria the proof of concept it needed to show the EPA that green infrastructure projects can provide innovative solutions to stormwater management while meeting long term sustainability needs. As municipalities pilot new technologies, they learn from each other and build off previous successes, forming an informal R+D chain for stormwater management. However, it took Peoria years to make its case, and if the city does not meet its milestones, it could become even harder for other green infrastructure projects to qualify to meet federal regulations.

What sets Peoria apart from other green infrastructure stormwater projects is that the pilots were driven by an explicit focus on social equity. Implementation began in areas of the city that have suffered from disinvestment. The i-team worked with community members and sought out projects that would address additional resident needs and interests, centering community benefits and engagement in identifying neighborhood-based infrastructure solutions. Well Farm, for instance, has a governance committee made up of local residents who work in partnership with the city, a local foundation, and a local non-profit.

The community outreach, city coordination, and fundraising for these pilots were supported by the Bloomberg i-team initiative, which provided the city with money and staffing. Some of the i-team's outreach strategies included working with the public health department to engage local residents and providing training on property redevelopment for small business owners. Along with the pilots, these types of small grassroots engagements built community support for ongoing experimentation and reduced resistance to the utility tax that will support larger investments.

## Other Communities

Across the country, numerous stormwater projects are experimenting with infrastructure upgrades that include climate resilience innovations. Some of these, such as Milwaukee's (see below), are managed by the local stormwater utility, but many involve new governmental partnerships, and some are financed through community-based public-private partnerships (CBP3s), such as the CBP3 in Prince George's County, Maryland.

One of the first cities to obtain federal consent decree approval for green water projects is Philadelphia, which began working with the EPA to develop green water infrastructure in 2011. The 25-year agreement between Philadelphia and the EPA seeks to reduce the city's combined sewer overflow by 85% and uses green water projects in conjunction with traditional stormwater systems. Within the first five years, Philadelphia exceeded its own targets and showed the efficacy of green infrastructure through projects developed on city-owned property. Philadelphia has adapted and scaled up many green water innovations that were developed elsewhere, such as the use of bioretention in Prince George's County.

The Milwaukee Metropolitan Sewerage District (MMSD), which manages wastewater from 28 municipalities, voluntarily began investing in green infrastructure in 2002. In 2007, MMSD incorporated green infrastructure into their CSO permit plan, which allowed them to regulate and fund green infrastructure projects within municipalities in their service area. In 2011, MMSD partnered with the City of Milwaukee to develop a plan that provides strategy and governs funding decisions for green infrastructure.

Like Philadelphia, Milwaukee relies on a combination of incentives and restrictions to support green stormwater development. Most of MMSD's funding comes from a tax levy, a portion of which is distributed to its municipalities. MMSD also provides rebates for certain projects and has very few regulatory requirements for projects. As a result, communities have invested in new approaches like green roofs, rain barrels, bioswales, and stormwater trees that can absorb water while also reducing carbon dioxide. These projects have captured 1.6 million gallons of water to date.

The United States is full of aging infrastructure that requires reinvestment. Stormwater projects are experimenting with green infrastructure innovations at multiple scales, from programs that encourage private residents to support stormwater retention to large projects on public lands. Whatever their scale, the complex dimensions and financing of these projects requires community buy-in. Because of their health and environmental impacts and regulations, stormwater infrastructure investments may precede other projects. Stormwater projects are experimenting with new climate resilience strategies at multiple scales, from programs that encourage private residents to support stormwater retention to large projects on public lands. Whatever their scale, the complex dimensions and financing of these projects requires community buy-in.



*Well farm Groundbreaking Ceremony, Greenprint Partners  
Photo Credit: Doug Leunig*

# Lessons

- ◆ **Piloting projects that include community engagement and benefits can build political will to support innovation.**
  - ▶ Peoria began by working in communities that had the least infrastructure investment and building pilots around needs identified by residents. Besides providing an opportunity for the city to meet other community needs, this approach made the benefits of the projects visible.
  - ▶ Although Peoria continues to see some resistance to the increased utility costs associated with its new stormwater utility, community engagement made the effort more politically viable.
  - ▶ When projects include amenities that increase livability and reduce risk of runoff, they can lead to increased property values. While these increases can generate municipal revenue and capital gains for homeowners, they can also lead to additional pressures for communities at risk of displacement.
  
- ◆ **Large infrastructure investments offer an opportunity to test a variety of innovative investments.**
  - ▶ Philanthropy's financial support (in the form of grants or PRIs) can create space for climate innovation on large infrastructure investments.
  - ▶ Local jurisdictions can learn from and build off innovations tried elsewhere.
  - ▶ Federal agencies can coordinate to support these innovations; in Peoria one federal agency funded the pilots that were used to convince another agency of the suitability of green infrastructure.
  - ▶ Building out climate-resilient infrastructure at the appropriate scale for local climate hazards may require new entities, such as Peoria's stormwater utility, that have tax and fee collection power.
  
- ◆ **Maximizing the co-benefits of climate investments increases buy-in along with impact.**
  - ▶ Because climate strategies involve many systems, there are a variety of opportunities to address a wide range of social issues through climate investments.
  - ▶ Combining small projects with larger investments helps increase public participation and buy-in for long term, more expensive investments. 🌱

# About the Author

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**Saneta deVuono-powell** is a co-founder and partner at Ground Works Consulting, where her focus is supporting equitable community development and climate justice. Saneta has over a decade of experience working on issues of racial justice, housing, and health and conducting community-based participatory research. She serves on the Oakland Rent Board, sits on the boards of the Texas Observer and The Safe Return Project, and is a contributing editor at Stranger's Guide. Saneta received her bachelor's degree from Sarah Lawrence College and both her law degree and her master's degree in city planning from UC Berkeley.

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