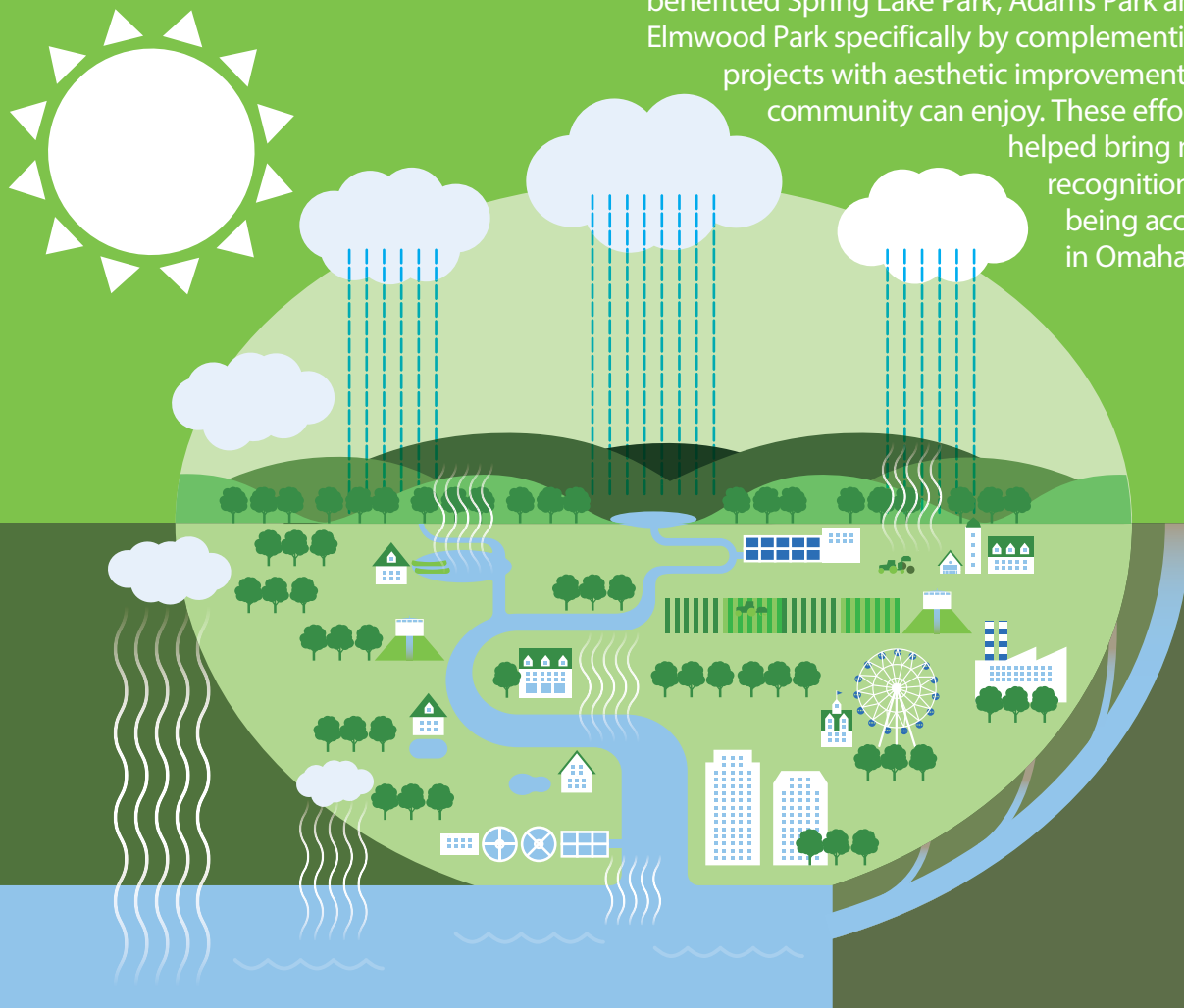


GREEN Infrastructure Benefits Omaha's CSO Program

In terms of stormwater management, green infrastructure manages stormwater at its source through practices that may store, filter, infiltrate, or detain stormwater in a manner that mimics natural processes.

When used, these practices can reduce pollutants like nutrients and sediment that enter our rivers, lakes and streams when it rains. While not officially termed *green infrastructure*, the City of Omaha has been using parks and boulevards to convey and store stormwater for years. So far, approximately 16 CSO projects have used green infrastructure, and all CSO project teams are required to evaluate the feasibility of including green infrastructure into their projects. As a result, the City has reduced costs by approximately \$15 million, improved water quality, reduced overflows from the combined sewer system and provided community amenities such as improved landscaping, wildlife diversity, and increased recreational opportunities.

Cooperative efforts between CSO project teams, Public Works and the Parks Department have benefitted Spring Lake Park, Adams Park and Elmwood Park specifically by complementing CSO projects with aesthetic improvements that the community can enjoy. These efforts have helped bring national recognition to what is being accomplished in Omaha.





Initial grading to expand and deepen the Fontenelle Park Lagoon began in 2017.



Fontenelle Park Lagoon construction continued through 2017 to add retaining walls, filtering, fish habitat and fishing outcrops.



Late winter 2018 brought the return of wildlife and the lagoon is starting to naturally retain water. Planting will occur over the spring and summer to provide new vegetation.

Several examples of Green Infrastructure Projects are given below and on the following page.

FONTENELLE PARK LAGOON GREEN INFRASTRUCTURE IMPROVEMENTS

The Fontenelle Park Lagoon Project is nearly complete. The size of the Fontenelle Lagoon has been expanded and deepened to promote infiltration of stormwater into the ground and to provide greater stormwater storage capacity. By providing additional storage capacity, stormwater flow rates and volumes will be reduced in the downstream combined sewer system, thereby reducing the size and future cost of downstream facilities, and reducing overflows to the Missouri River.

Other CSO Green Infrastructure Projects

- Adams Park
- Albright Park
- Bohemian Cemetery
- Elmwood Park
- Hanscom Park
- Hitchcock Park
- Miller Park
- Spring Lake Park



Lagoon inlet screens were added to remove pollutants from stormwater that enters the system from surrounding residential neighborhoods. Vegetation changes in the park will increase stormwater infiltration. Amenities around the lagoon will include fishing access, walking trails, and attractive landscaping. Construction on this project began in 2017 and is expected to be complete in 2018.



Elmwood Park

ELMWOOD PARK

The Elmwood Park Diversion, just south of Elmwood Park Drive and west of 60th Street, was completed in the spring of 2012 as part of the CSO Program's Aksarben Village Neighborhood Sewer Separation Project. The diversion plan pairs the cleaning of water using green infrastructure with new pipe systems. Seven slotted-weir structures with varying vertical drops of one to three feet were constructed within the ravine to reduce stormwater velocity and lower erosion potential. Three bioretention gardens are located just above the weirs. At the base of the ravine, a dry detention basin collects flows into an outlet structure connected to a bypass pipe directing flows into Elmwood Creek. The diversion is estimated to have saved \$550,000 on the project, including costs associated with its construction, which resulted in fewer construction disturbances to the neighborhood.



Adams Park

ADAMS PARK

Modifications to Adams Park were part of the John Creighton Boulevard and Adams Park CSO Project. The green infrastructure in Adams Park was a result of the Adams Park Master Plan, which was an outgrowth of the North Omaha Villages Revitalization Plan. This plan called for a renewed focus on Adams Park and other areas in the community as a catalyst for urban growth and revitalization. As part of the master plan, the Adams Park wetlands and detention area was designed to provide maximum practical stormwater storage, in conjunction with the Omaha CSO Program. The wetlands consist of an area covering approximately 14 acres. The wetland facility was designed to provide water quality benefits and beautification elements to the park. In addition, the project allows for a more effective use of existing downstream facilities and reduced costs.



Spring Lake Park

SPRING LAKE PARK

Modifications to Spring Lake Park were part of the CSO 117 – Missouri Ave Phase 1 Project. Spring Lake Park is located in South Omaha, and was originally established in the 1870s as an urban park with a lake. Following World War II the lake was drained, and Spring Lake Park became a dumping ground instead of a place for families to gather for picnics and other activities. A group of community advocates and the CSO Program collaborated with Omaha's Parks Department to reestablish the lake, develop wetlands and a broad range of green infrastructure elements that have transformed the area. Upon completion in the spring of 2017, the wildlife habitat is more diverse and plentiful, the lake has been stocked with fish, and residents have reclaimed the park. In addition to enhancing the beauty of the park, the green infrastructure reduced the need for the construction of a new, larger diameter pipe system downstream of the detention ponds, which saved the City approximately \$5 million in "gray infrastructure." Several grants from Nebraska Environmental Trust further reduced the City's cost. Currently, Phase 2 of the project is under construction, including sewer separation and green infrastructure projects to further reduce stormwater flows in the Spring Lake Park Golf Course.



Hanscom Park

HANSCOM PARK

Unlike other projects, the Hanscom Park Green Infrastructure CSO Project is not associated with a sewer separation project. Hanscom Park, Omaha's oldest park, was donated to the City in 1872, with park improvements designed in the early 1890s by the noted landscape architect, HWS Cleveland. The 58-acre park includes extensive natural green space, picnic areas, a playground, small informal soccer and baseball fields, an indoor tennis center, splash pool, dog park, lagoon, formal gardens, the City greenhouse, and a pavilion. The project includes facilities in the southwest portion of the park to manage stormwater from areas west of and within the park. In addition, improvements will be made to the Hanscom Park Lagoon to manage flows from areas within the park and the outflow from the green infrastructure facilities. Improvements to the lagoon include construction of a new outlet control structure to control flows from the lagoon that discharge to the existing combined sewer. These modifications will result in a reduction in the magnitude, frequency and duration of combined sewer overflows into the Missouri River as well as an improvement in water quality.