DAY 2/NBS FOR URBAN AND RURAL LANDSCAPES

Urban NBS Case Studies: United States

Urban NBS for Stormwater Management

Philadelphia, Pennsylvania

Wilmington, Delaware

Tucson, Arizona

Seattle, Washington

Philadelphia, Pennsylvania

- 1.6 million people
- Bound by Delaware and Schuylkill rivers
- Historic U.S. city and infrastructure, including municipal water supply system
- High poverty rate (>22% of population)
- Inequitable distribution of parks and green spaces
- Northeast U.S. - climate impacts include increasing temperatures and increasing precipitation

Philadelphia's Combined Sewer Overflow

In dry weather, only wastewater from homes flows into our combined sewers... and then to the treatment plant.

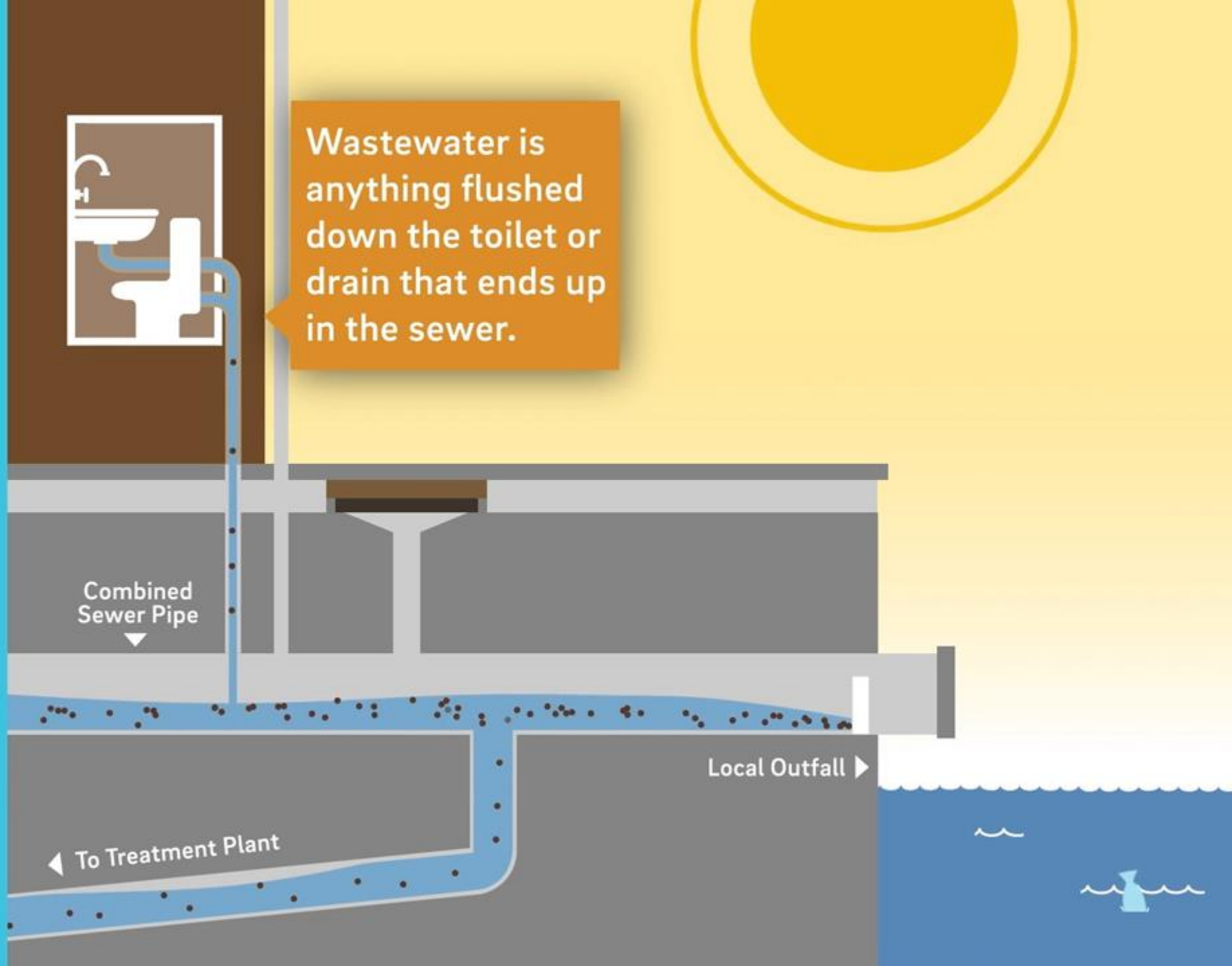


Image credit: Philadelphia Water Department

Philadelphia's Combined Sewer Overflow

Those combined sewers can't always handle the extra water from storms... and can overflow.

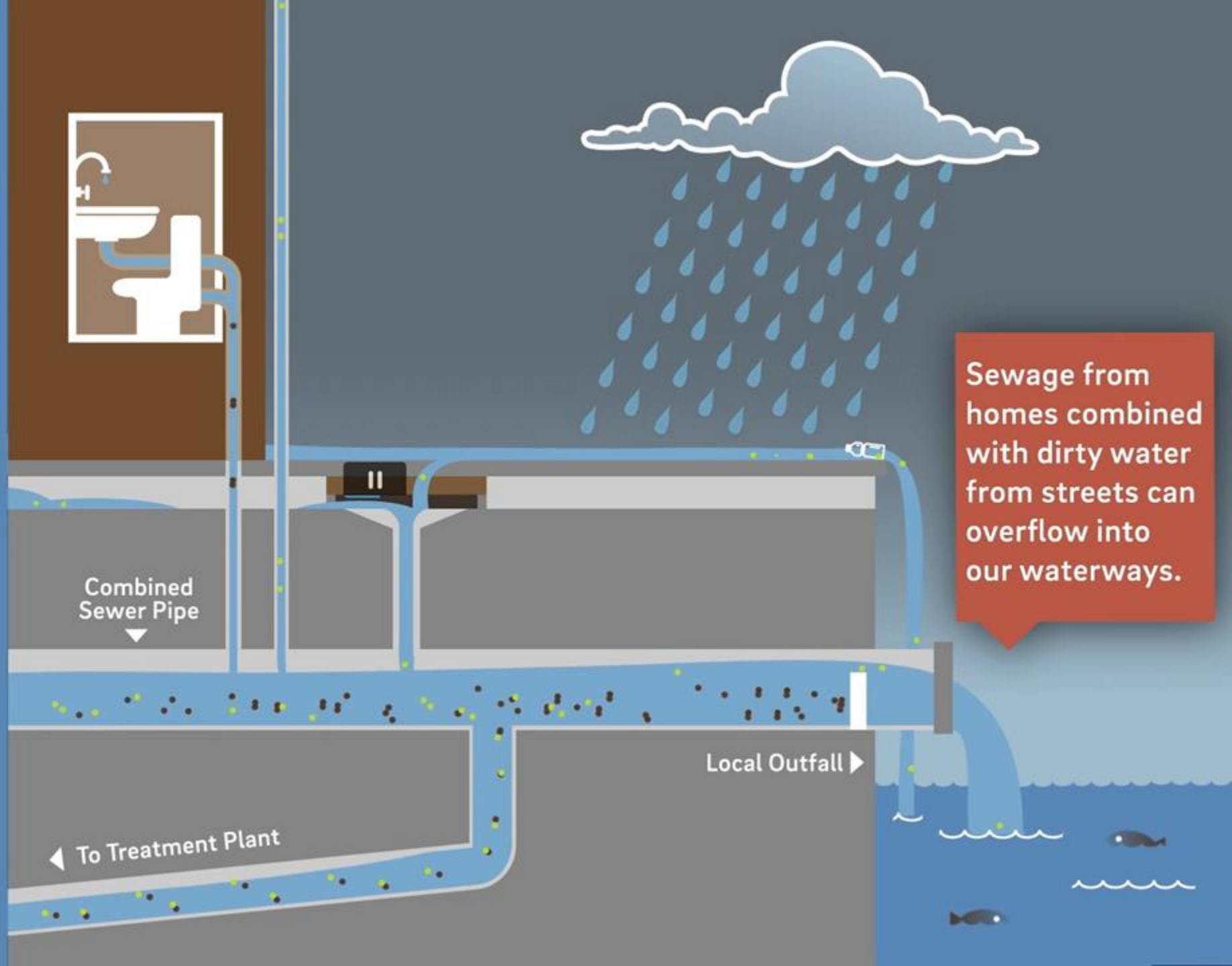


Image credit: Philadelphia Water Department

Philadelphia's Combined Sewer Overflow

Green tools store polluted runoff and plants soak up some extra water... helping stop overflows.

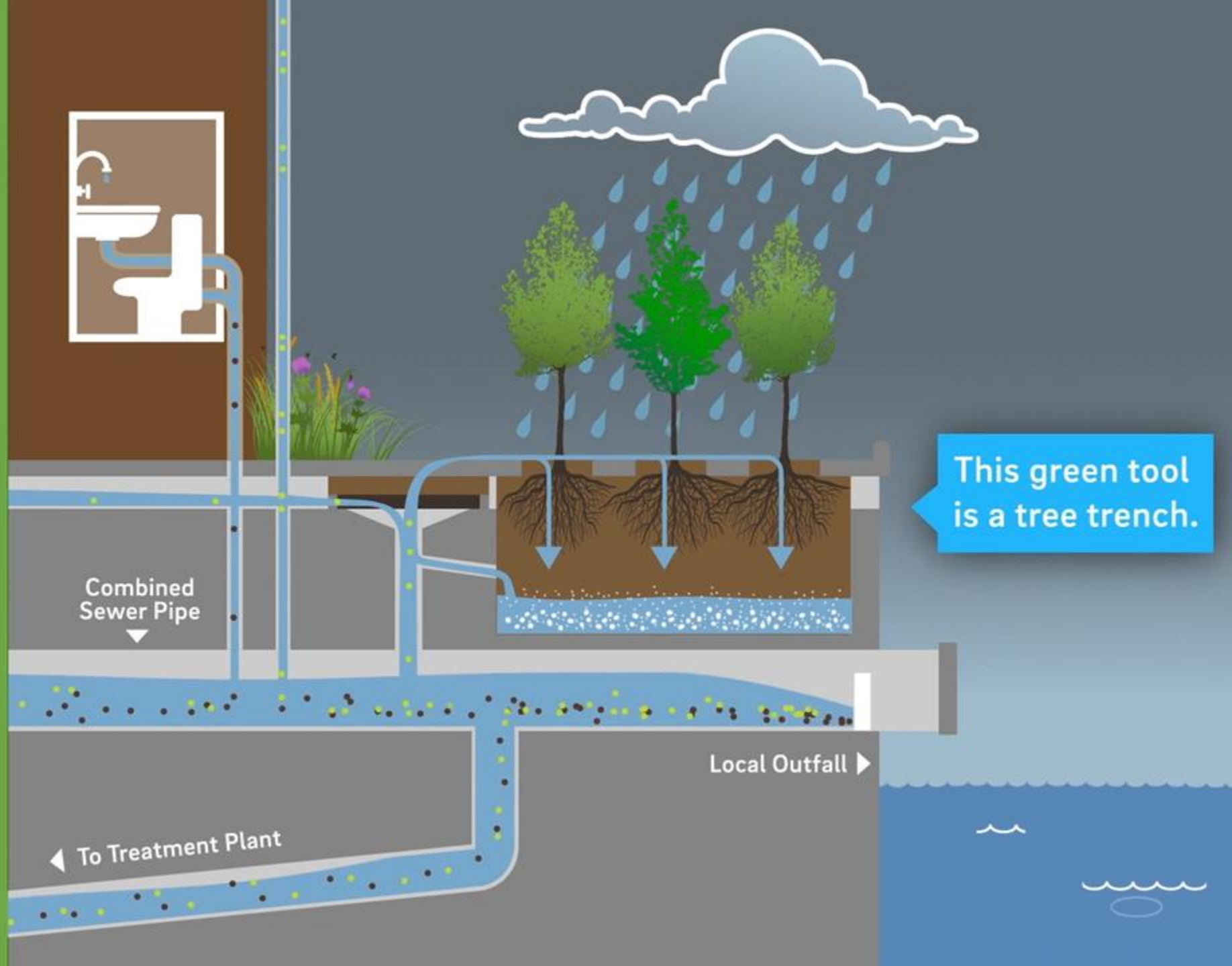
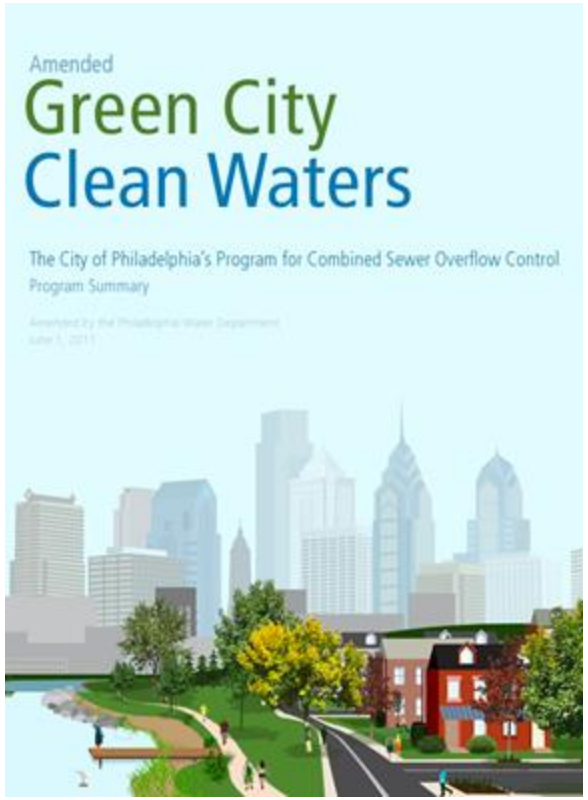
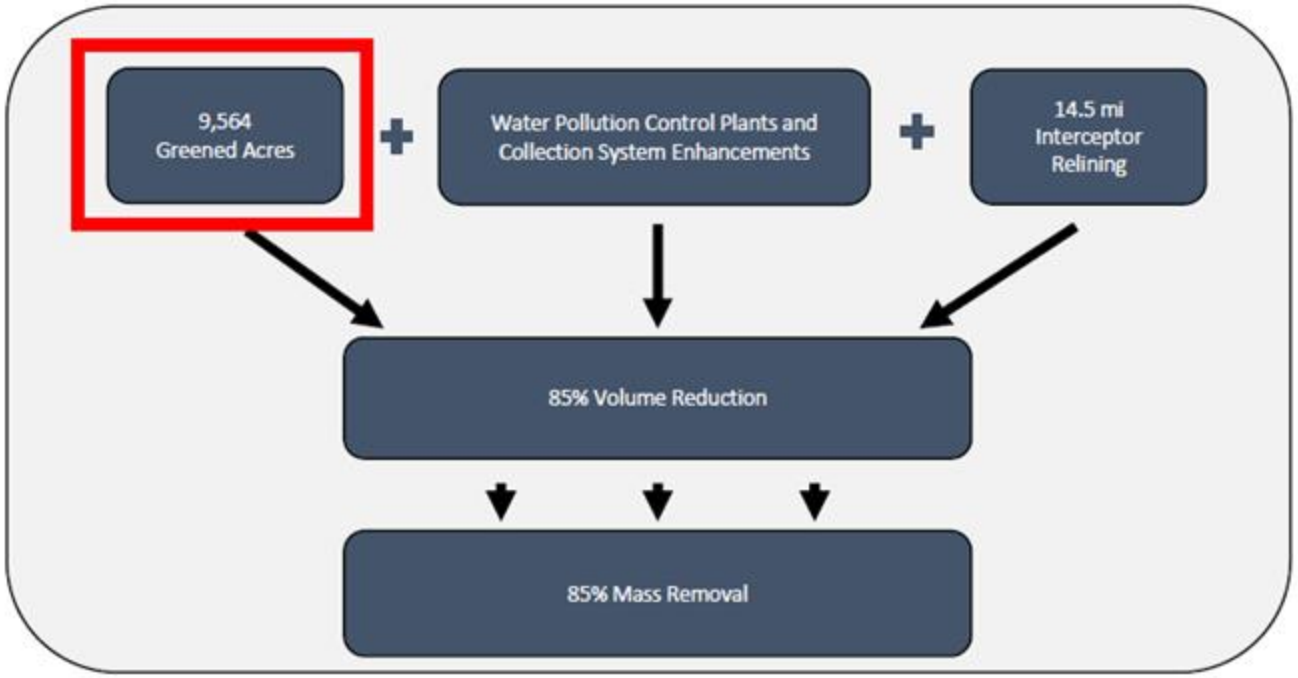


Image credit: Philadelphia Water Department

Green City, Clean Waters Plan

PHILADELPHIA WATER DEPARTMENT





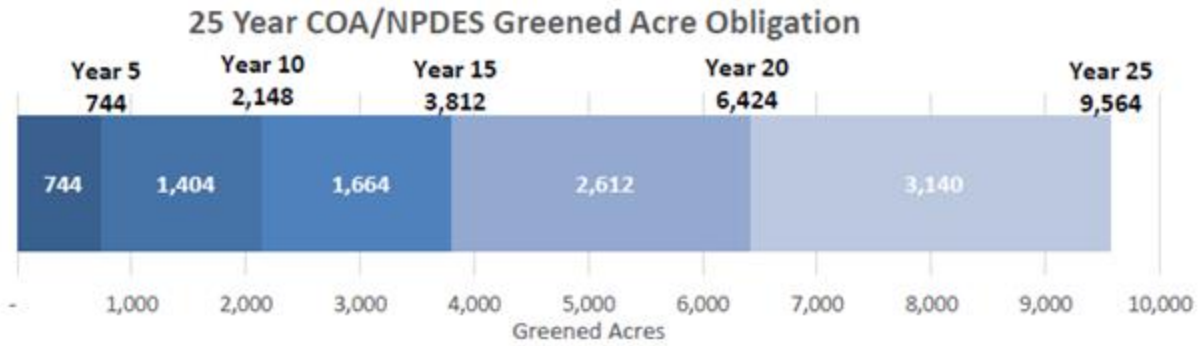
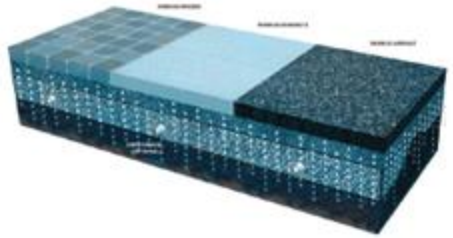


Image credit: Philadelphia Water Department

“Green tools”

Rain Gardens

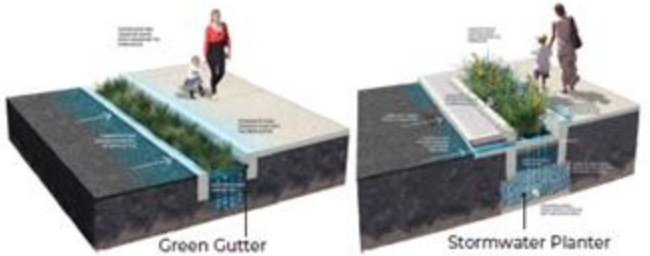
Porous Pavement



Downspout Planters and Rain Barrels

Stormwater Bumpouts

Stormwater Planters and Green Gutters



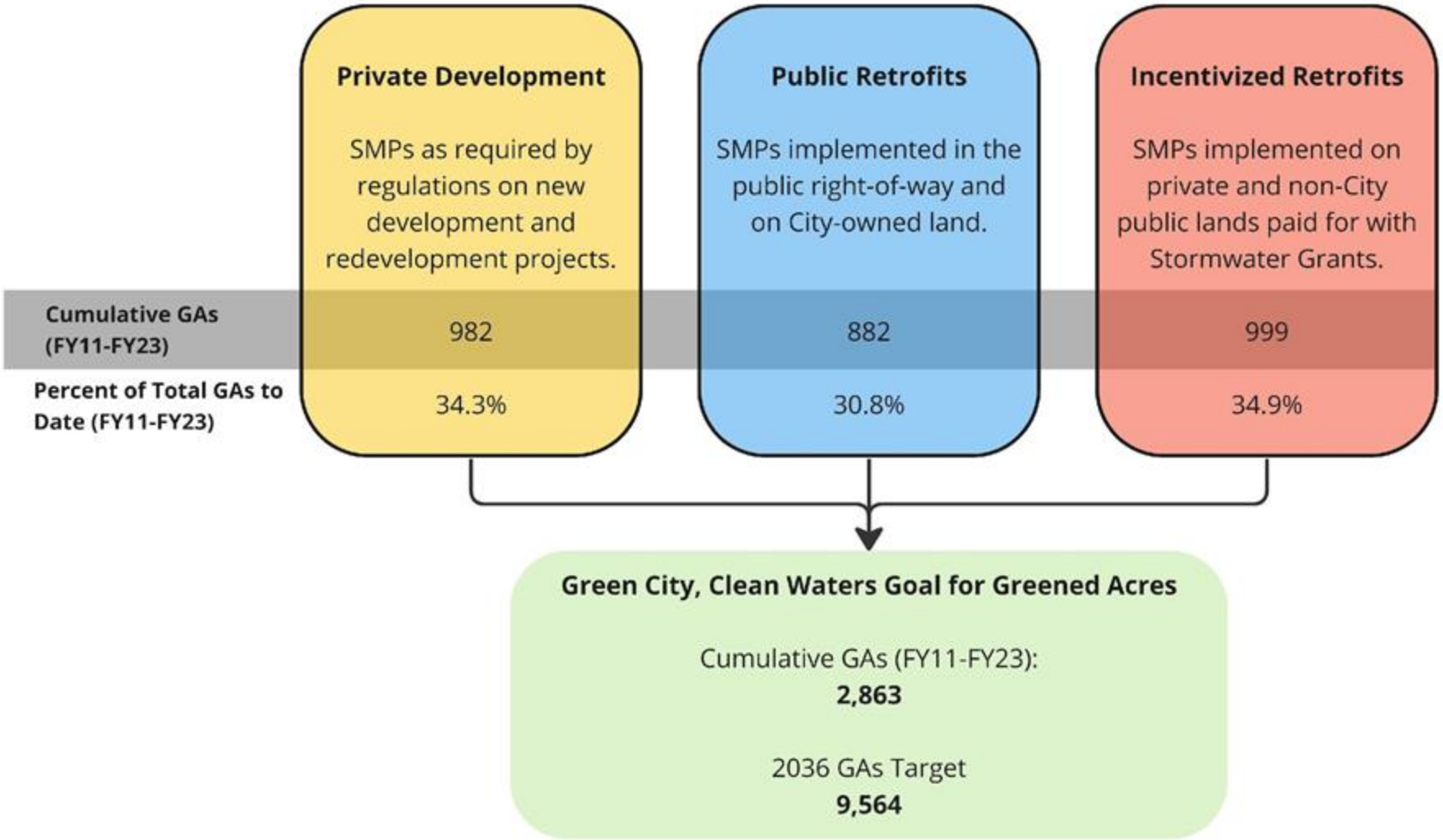
Tree Trenches & Stormwater Trees

Image credit: Philadelphia Water Department

Approaches adapted to specific sites

Image credit: Philadelphia Water Department

Project Pipelines



Green City, Clean Waters Plan

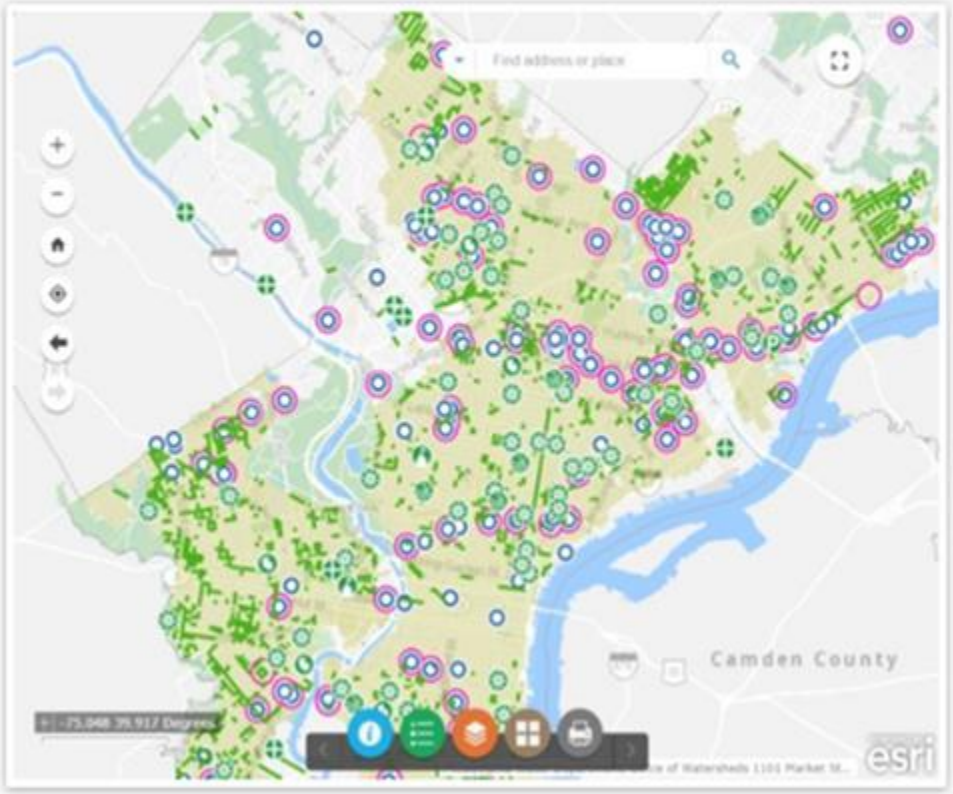
Green City, Clean Waters continues to make tremendous progress since launching in 2011. We exceeded our 10-year pollution reduction goal, with new infrastructure investments now keeping nearly **three billion gallons** of stormwater runoff and sewer overflow out of local waterways.

We've installed more than
2,800 green tools...

...at nearly
800 sites
throughout the city...

...keeping more than
2.7 billion gallons
of polluted water out of our rivers.

For more details, see the city's CSO Long Term Control Plan and Annual Reports →



Click the map to see Green Infrastructure in your neighborhood or **visit Projects & Construction to see what's coming soon**

Image credit: Philadelphia Water Department

Co-benefits of Urban NBS

Environmental

Using plants in green tools benefits our environment

- Improves water quality and supply
- Improves air quality
- Reduces carbon emissions
- Creates wildlife habitat

Economic

Investing in green tools boosts Philadelphia's economy

- Creates local jobs
- Increases property values
- Promotes recreation and tourism
- Increase local business investments
- Save on energy costs
- Avoided infrastructure replacement costs

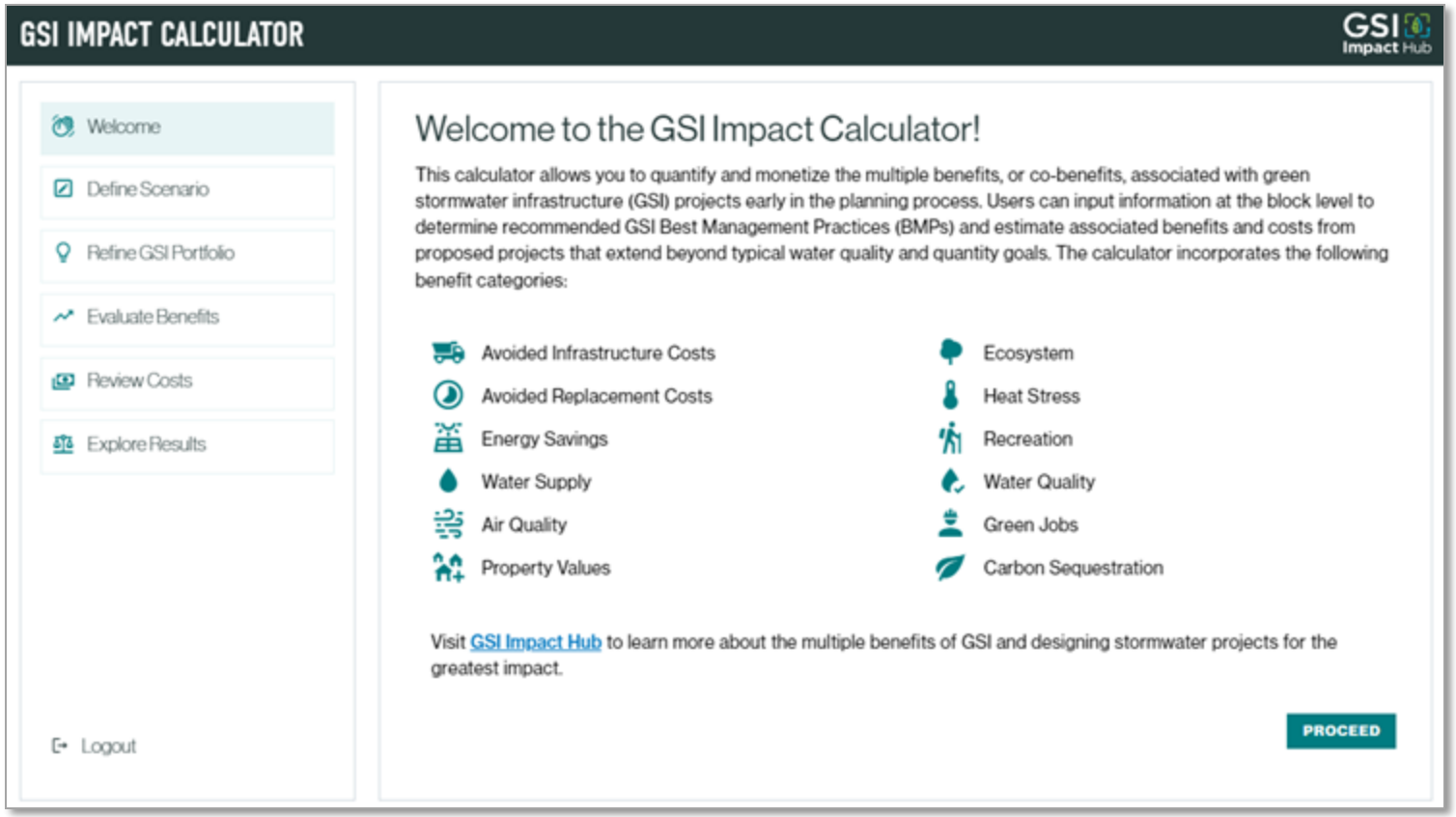
Social

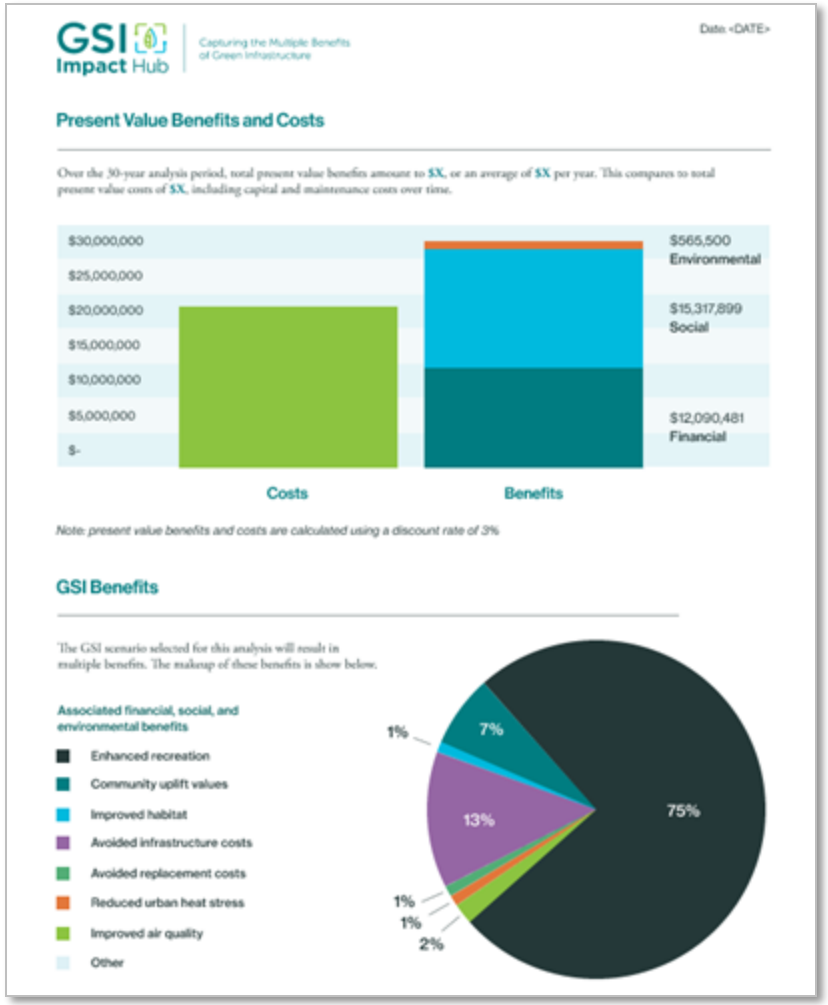
Adding green tools creates healthier communities

- Reduces urban heat
- Reduces flood risk
- Improves physical and mental health
- Creates parks and green space
- Increases equitable access
- Promotes social cohesion

Image credit: Philadelphia Water Department

Quantifying Co-benefits of Urban NBS





Wilmington, Delaware

Southbridge Wilmington Wetlands Park

- 20-acre park completed in 2022
- Reduce flooding to Southbridge neighborhood
- Restore and enhance existing tidal wetlands
- Included separation of existing combined sewer system
- Remediated contaminated soils at brownfield site
- Improved recreation and access to new development

Southbridge Wilmington Wetlands Park

Image credit: RK&K, City of Wilmington

Tucson, Arizona

Sweetwater Wetlands

- Completed by Tucson Water in 1996
- Constructed to refine effluent from wastewater treatment plant and recharge into aquifer for water supply
- Urban wildlife refuge
- Recreational amenities and connection to bike trail
- Southwest U.S. - climate change impacts include increasing temperatures (and less snowpack) as well as decreasing precipitation

Sweetwater Wetlands

Image credit: Tucson Water

Seattle, Washington

Aurora Bridge Bioswales

- Bio-swales and other green infrastructure practices completed in 2020
- Located below I-5 highway bridge
- Mitigates 98 million gallons of runoff to Lake Union and neutralizes toxins that are lethal to salmon
- Creates community green space
- Incorporates environmental education
- Northwest U.S. - climate change impacts include increasing temperatures leading to less snowpack and more rain

Aurora Bridge Bioswales

Image credit: Weber Thompson, Meghan Montgomery/Built Work pHotography, Justin weber

THANK YOU