Philadelphia Water Department:
Implications of Climate Change

Glen J. Abrams, AICP
Strategic Planning and Policy Manager
Philadelphia Water Department, Office of Watersheds

How Does Climate Change Affect PWD?

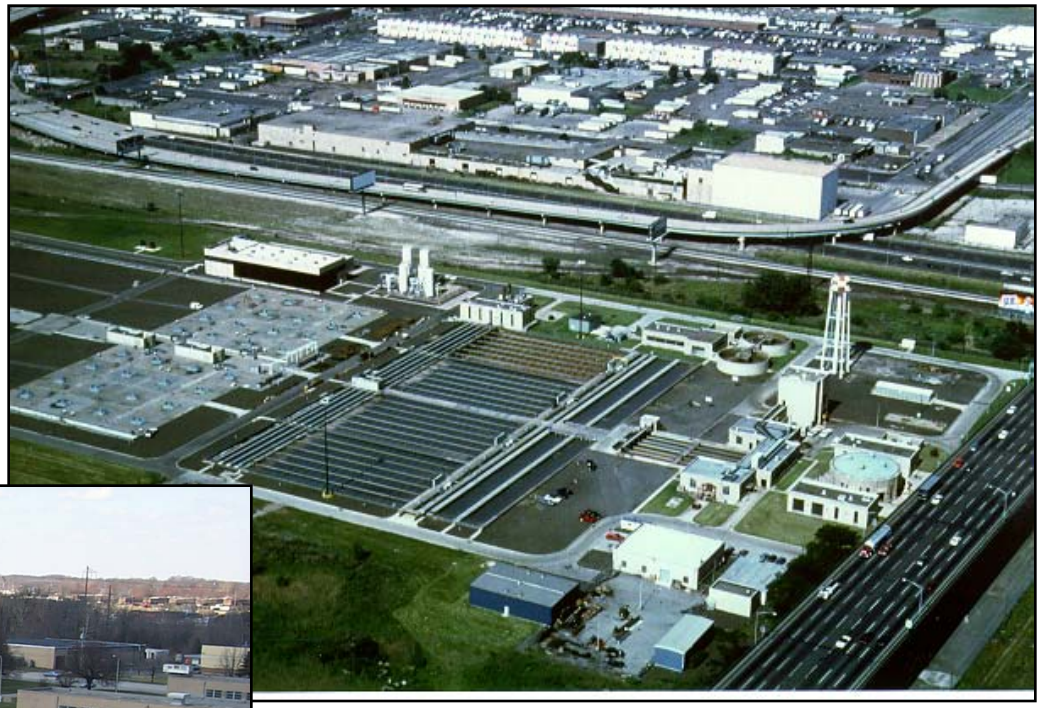
Operations

Infrastructure

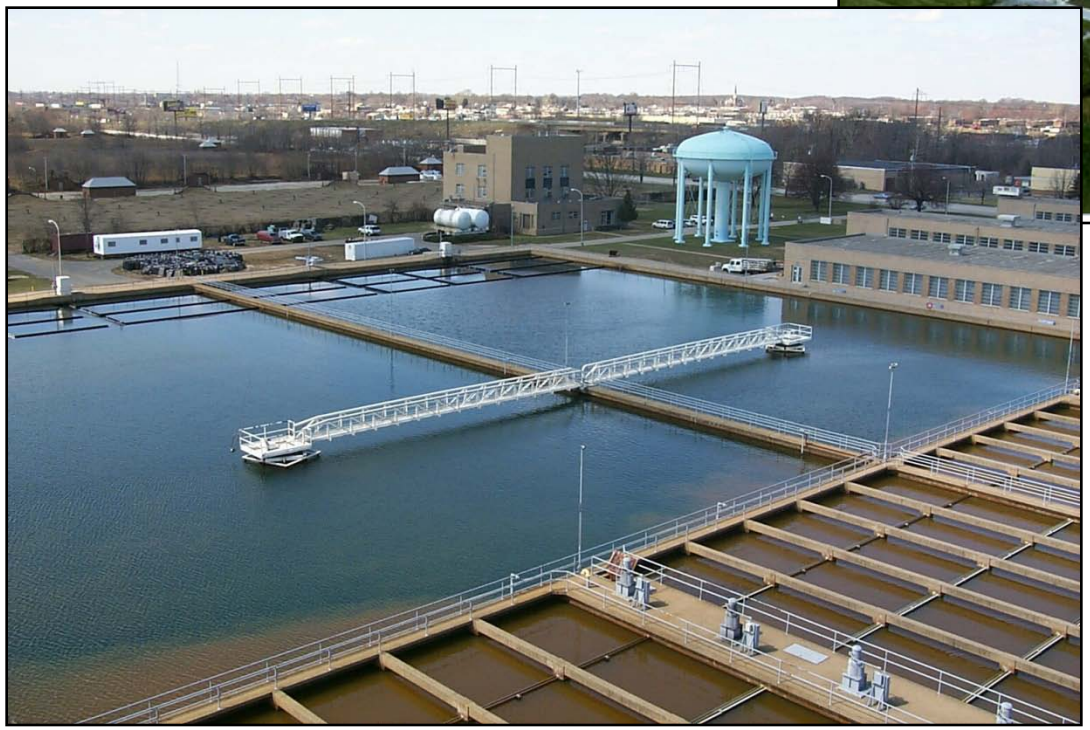
Source Water Supply

Regional Environmental Quality

PWD Operations



Wastewater Treatment



Drinking Water Treatment

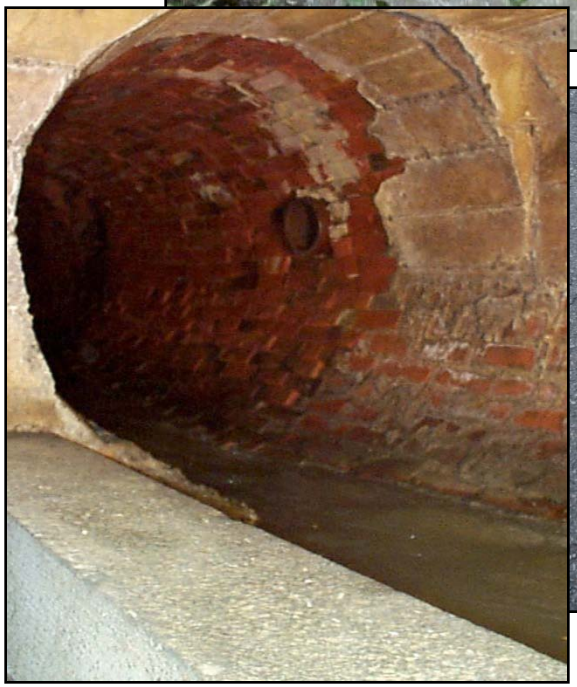
PWD Infrastructure

philly.com

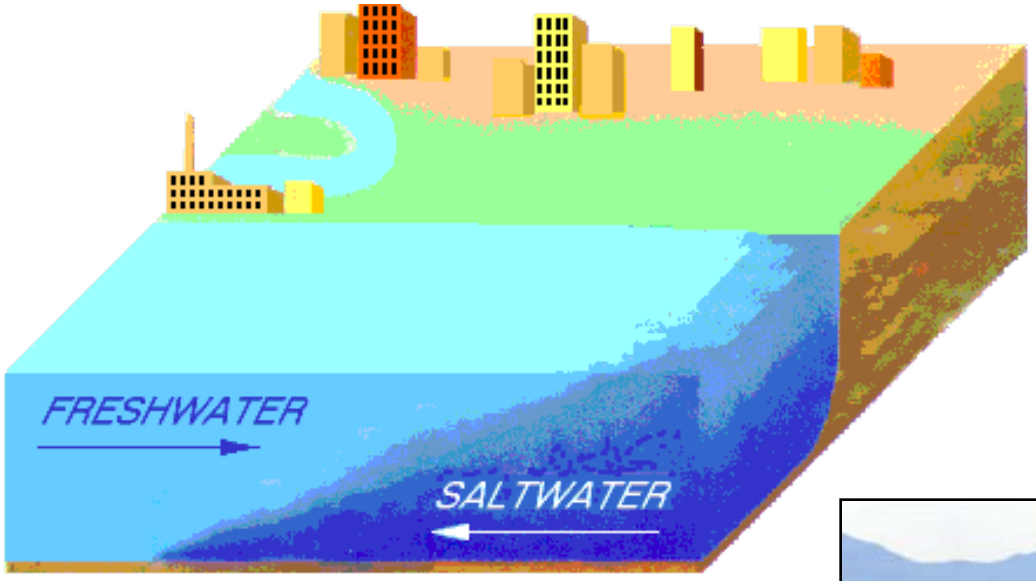
"It's like Katrina – but underground."
Margaret Kalalian, East Passyunk Crossing Civic Association

MICHAEL BRYANT / Inquirer Staff Photographer
Marie Frisbie of the 100 block of West Allen Street in Northern Liberties adjusts a lightbulb in her basement. Floods of sewage during increasingly frequent big rains have ruined most of the belongings she stores there.

More rain, old sewers make for nasty story



PWD Source Water Supply



Salt Water Intrusion

Drought Frequency

Reservoir Capacity and Management

Regional Environmental Quality

Already-Stressed Water Cycle

Extreme Weather Events

Sustaining Aquatic Life in Already-Stressed Rivers and Streams

Recreation and Eco-tourism

An Integrated Utility…

Philadelphia Water Department

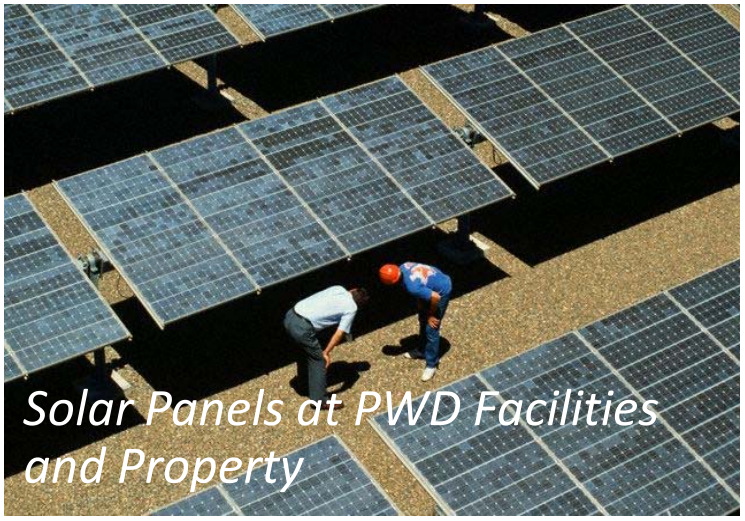
» Drinking Water
» Wastewater
» Stormwater

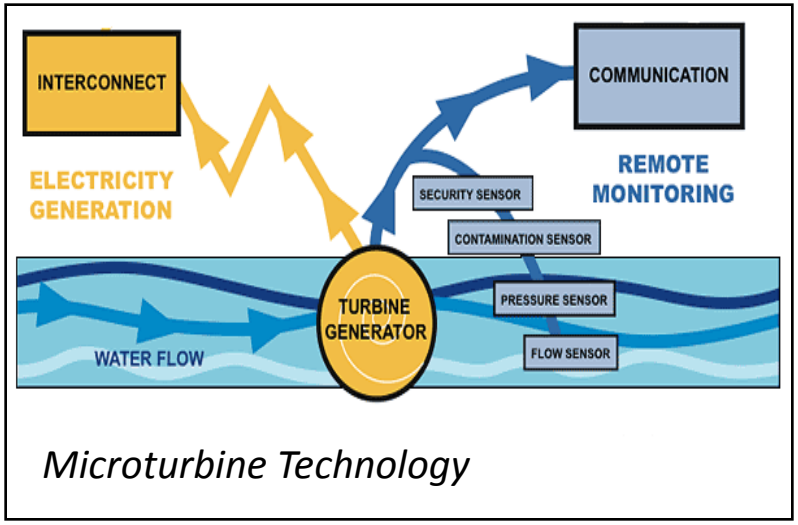
… An Integrated Approach

» Land
» Waterways
» Infrastructure
» Community
» Partnerships

Mitigation
Adaptation
Sustainability

Mitigation ~ Reducing Greenhouse Gases





Adaptation ~ Climate Change Conditions

Increased Storm Intensity

- Street Greening, Stormwater Parks and Wetlands
- Riparian Buffers and Open Spaces
- Capture and Infiltration Systems
- Porous Pavement, Homeowner Education

Urban Heat Island Effect

- Green Roofs, Bio-Retention and Rain Gardens
- Stormwater Management & Architecture

Sea Level Rise

- Water Resources Management, Risk Assessment

Sustainability ~ Imagination; Innovation; Action

Green City, Clean Waters

Green Stormwater Infrastructure

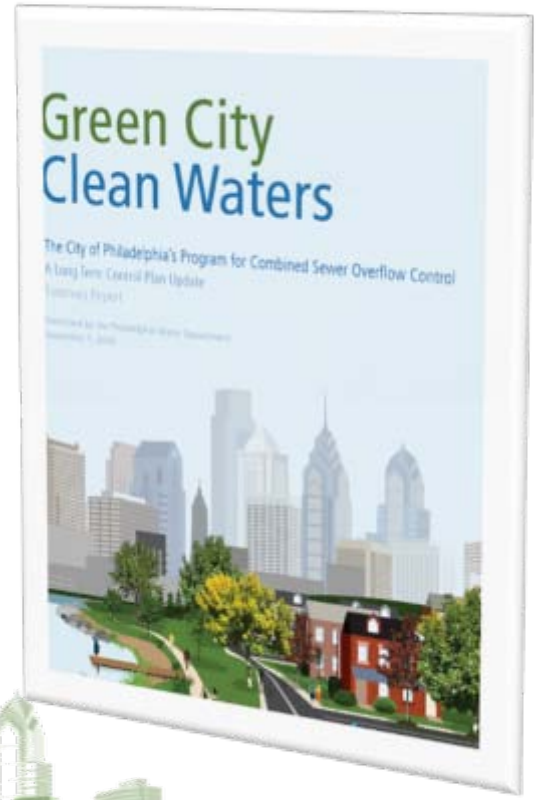
$1.01 billion

Stream Corridor Restoration and Preservation

$290 million

Wet Weather Treatment Plant Upgrades

$320 million



"This is the most significant use of green infrastructure I've seen in the country, the largest scale I've seen."

Jon Capacasa, EPA regional director of water protection

Breaking ground with a $1.6 billion plan to tame water

By Sandy Bauers
INQUIRER STAFF WRITER

Philadelphia has announced a $1.6 billion plan to transform the city over the next 20 years by embracing its storm water — instead of hustling it down sewers and into rivers as fast as possible.

The proposal, which several experts called the nation's most ambitious, reimagines the city as an oasis of rain gardens, green roofs, thousands of additional trees, porous pavement, and more.

A City Transformed
Proposals would better guide Philadelphia's water. **Graphic, A14.**

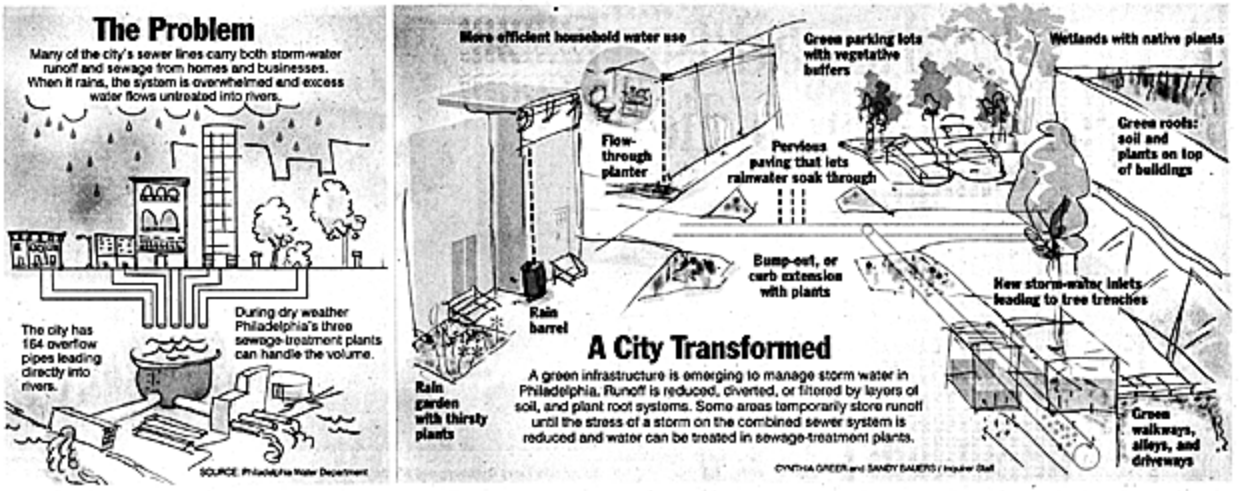
All would act as sponges to absorb — or at least stall — the billions of gallons of rainwater that overwhelm the city sewer system every year.

The plan's complex funding formula would raise rates somewhat but also attract grants and encourage private investment.

Further, the Water Department says the city's greening would result in more jobs, higher property values, better air

See **STORMWATER** on A14

The Philadelphia Inquirer
Sunday, Sept. 27, 2009 ★ Locally Owned & Independent Since 2006 ★ $1.75



A green plan to embrace any deluge

HOW TO MANAGE STORMWATER /REDUCE CSOs

New Approach:

Distributed Green Stormwater Infrastructure System

Design Urban Sites to enable rainfall to:

Infiltrate

Evaporate

Be Reused

OUR GOAL: 9,500 IMPERVIOUS ACRES CONVERTED TO "GREENED ACRES"

- Enforce strong stormwater **regulations** on development
- Create stormwater **billing** structure that rewards good practices
- Direct eight ambitious and innovative **Green Programs** to invest in green stormwater infrastructure

Green Stormwater Infrastructure Offers Advantages Over Conventional Systems When Considering Climate Change

1) Offsets Storm Intensity

2) Mitigates Urban Heat Island Impacts

3) Reduces Greenhouse Gas Production

4) System Can Be Adapted to Changing Conditions

However, Several Policy Issues Arise When Considering Water Resources Management and Climate Change

1) Agreements/Percent Capture Based on Historical Rainfall; What Happens When Rainfall Patterns Change?

2) How is Green Infrastructure Performance Measured? How is GI Performance Linked to Enforcement?

3) How Can EPA and State Agencies Encourage (or Require?) Regional Coordination

4) What is the Relationship to Smart Growth Policies? Open Space/Forest Protection is Key to Drinking Water Protection

THANK YOU

Glen J. Abrams, AICP
Strategic Planning & Policy Manager
glen.abrams@phila.gov
215-685-6039

http://www.phillywatersheds.org