Water for our Future, Legacies from the Past

2015 New Jersey Sustainability SUMMIT

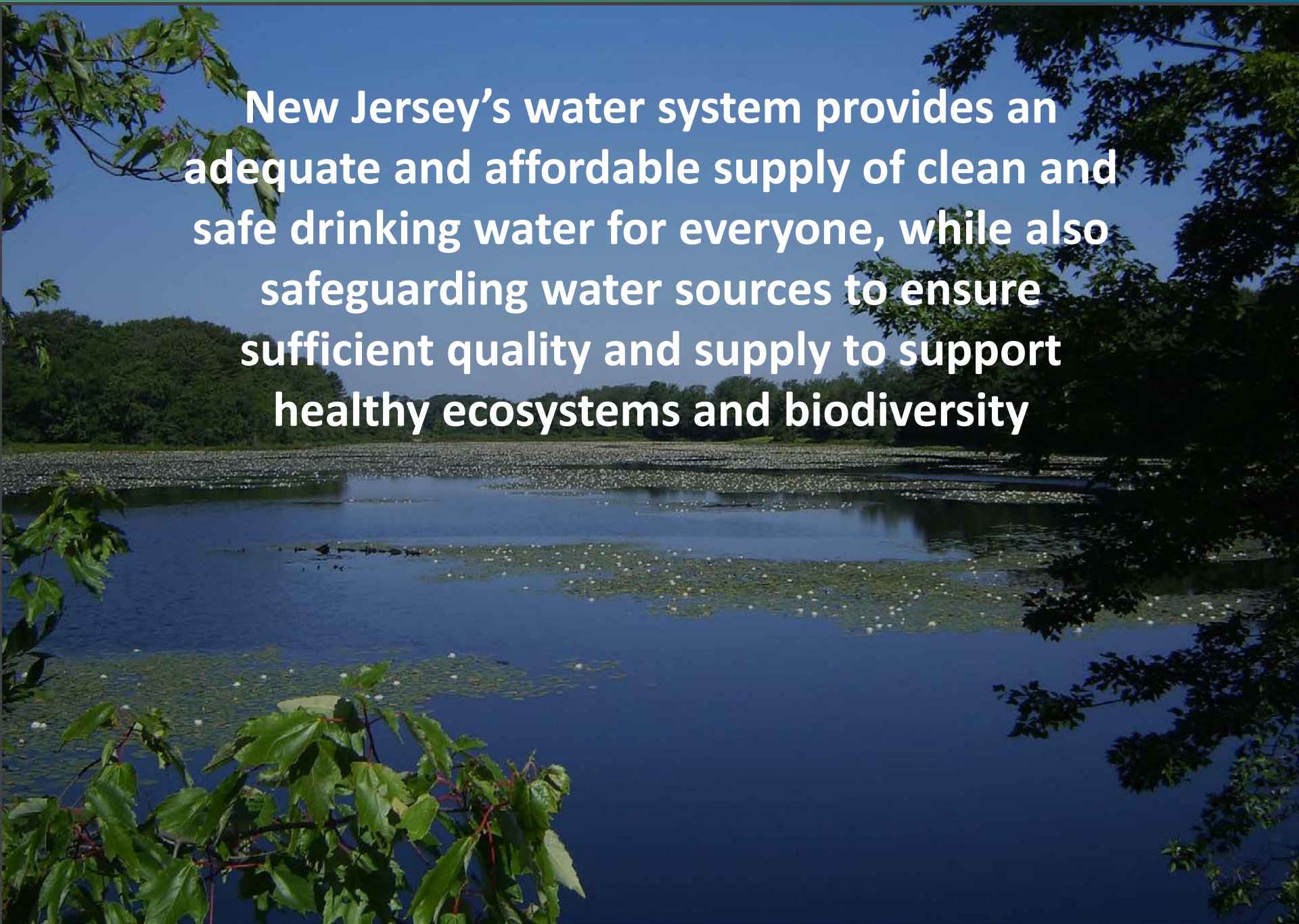
Chris Sturm
New Jersey Future

About New Jersey Future

Smart Growth
research, policy, advocacy and assistance

www.njfuture.org

NEW JERSEY FUTURE


New Jersey's water system provides an adequate and affordable supply of clean and safe drinking water for everyone, while also safeguarding water sources to ensure sufficient quality and supply to support healthy ecosystems and biodiversity

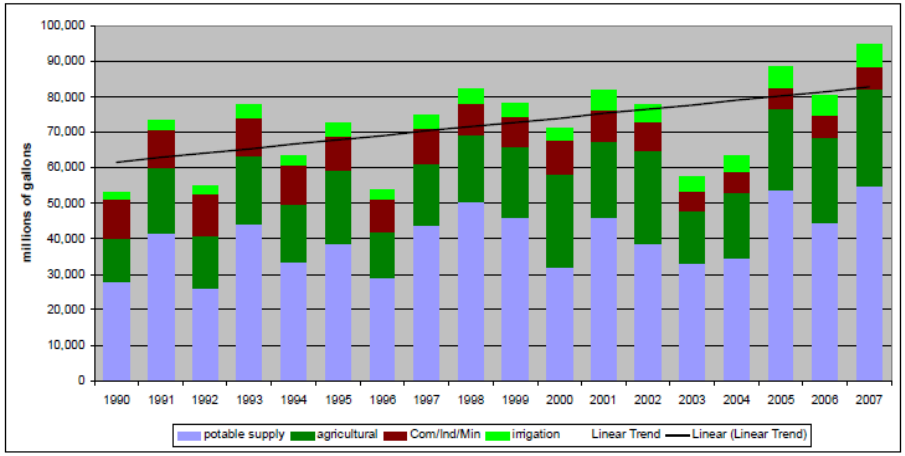
How is New Jersey Doing?

NEW JERSEY FUTURE

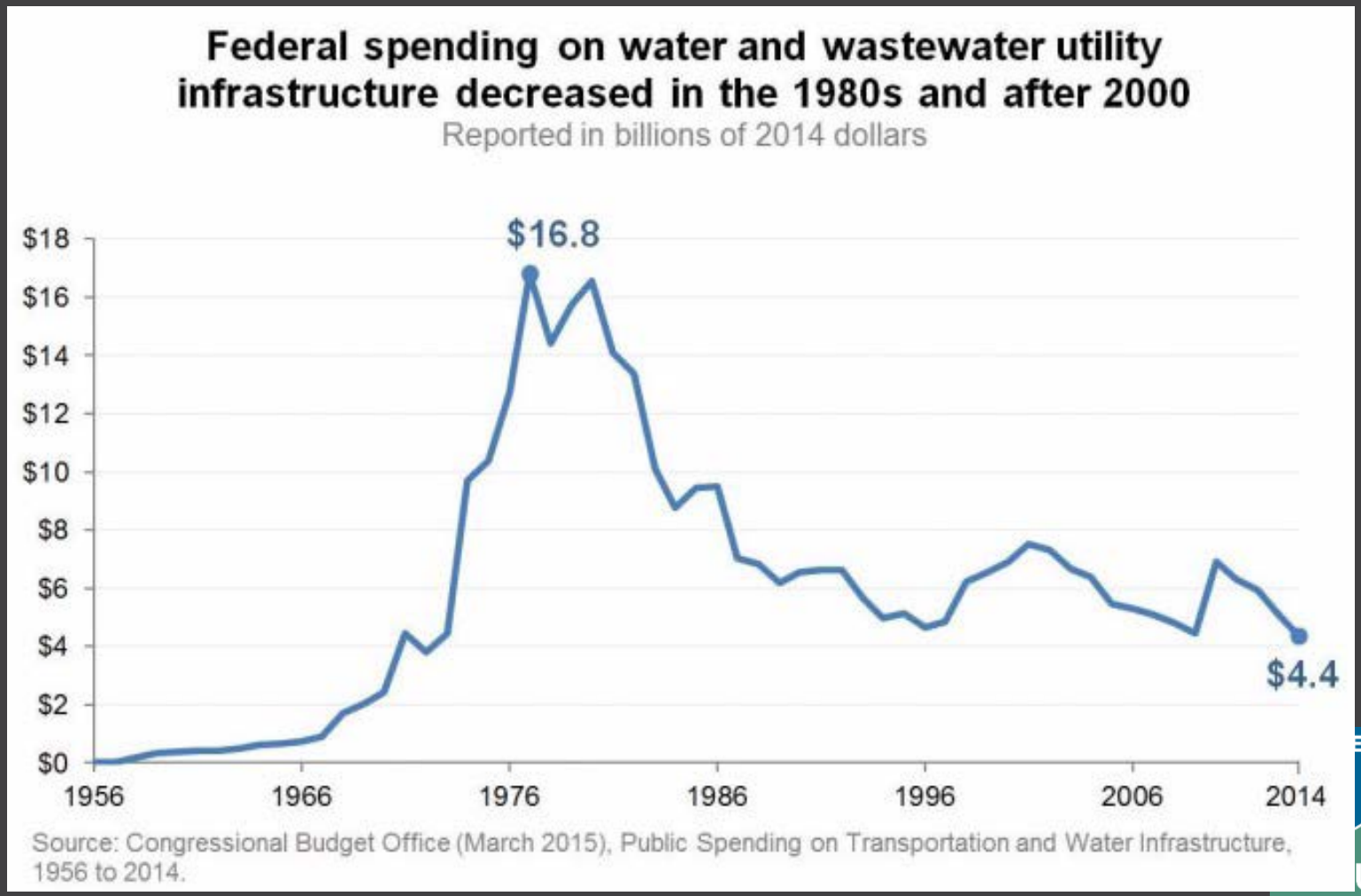
Water Quality:
Nonpoint Source Pollution

Growing Water Use and Its Impacts

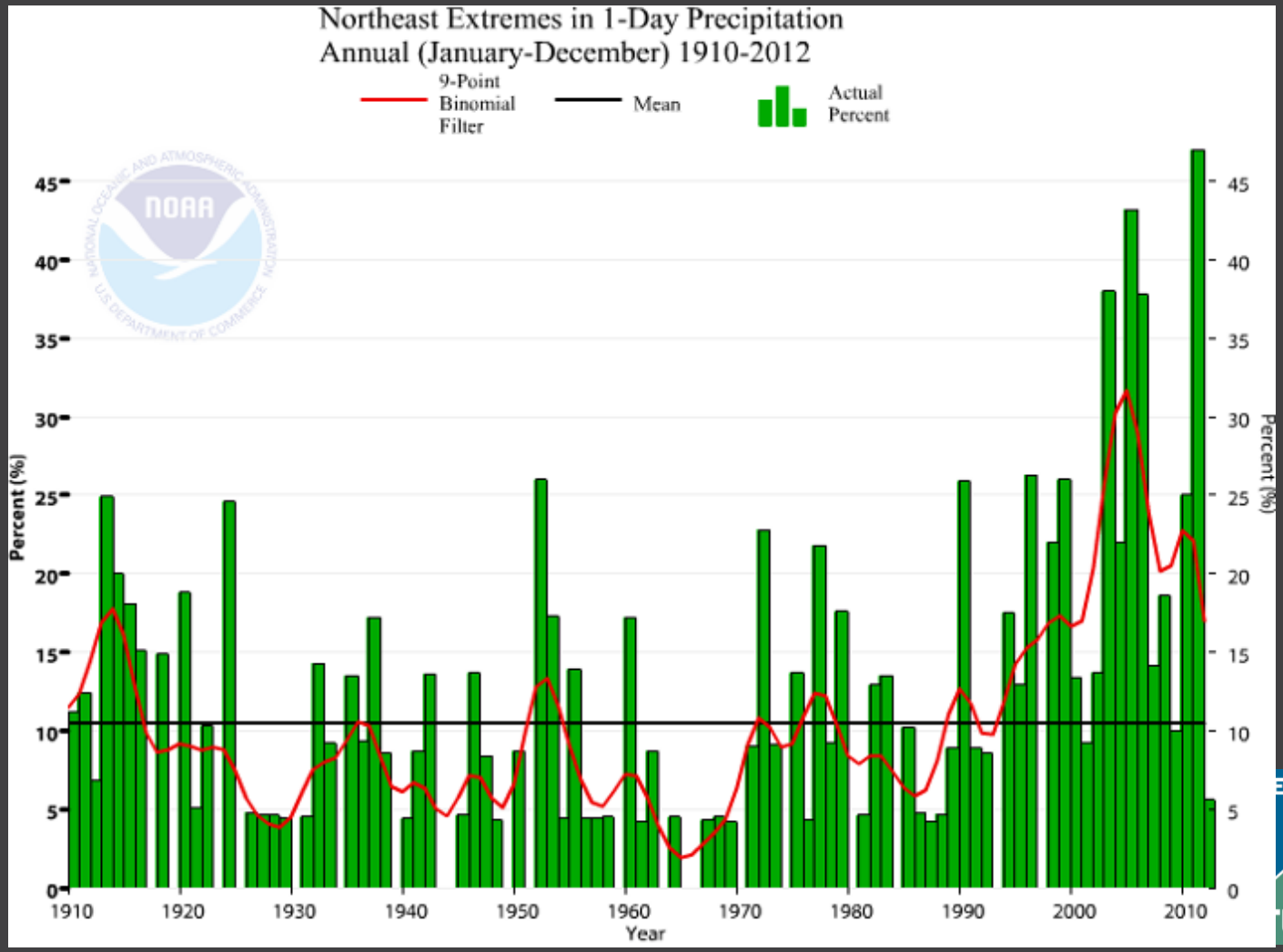
Annual NJ Consumptive Uses (NJDEP 2012)



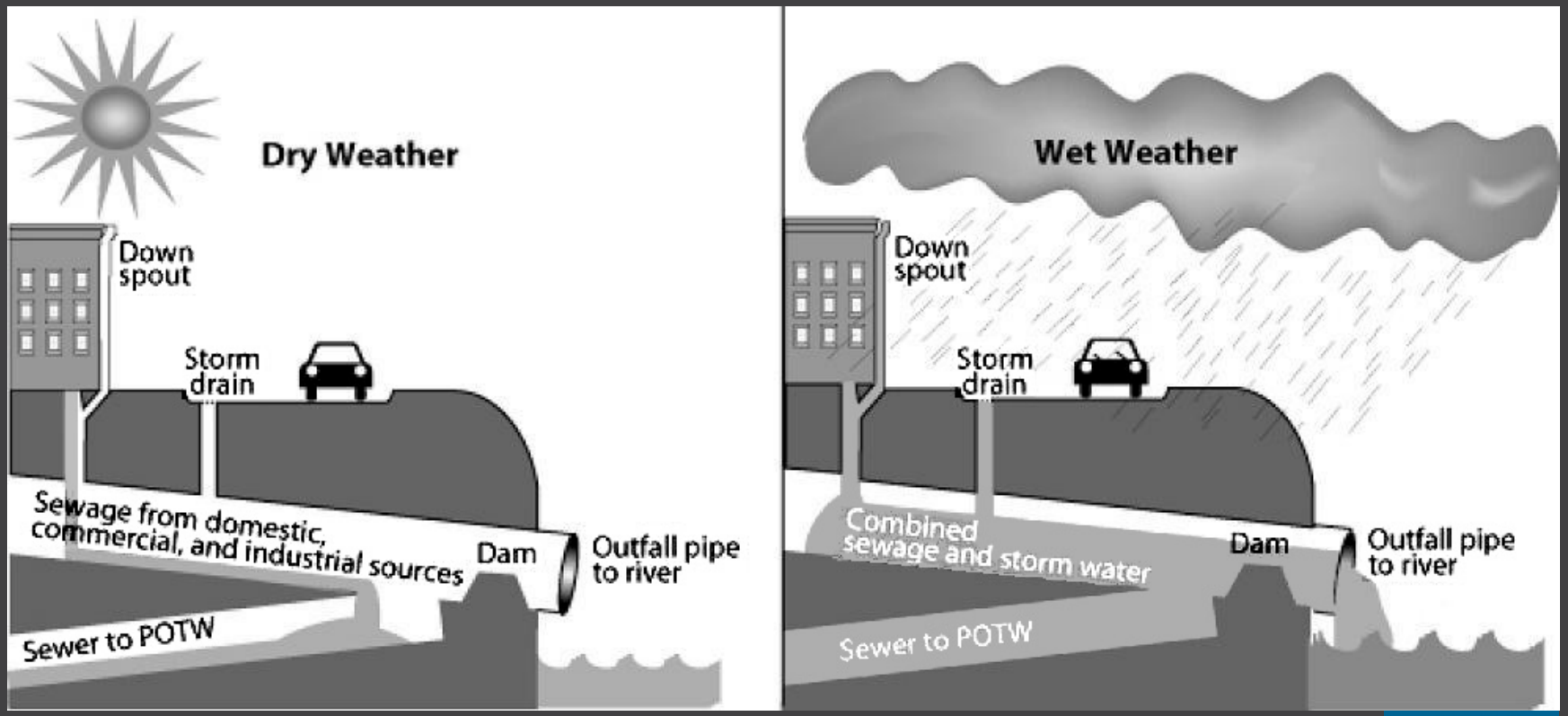
The Water System: Underfunded and Underperforming



The Water System:
Climate Change Challenges

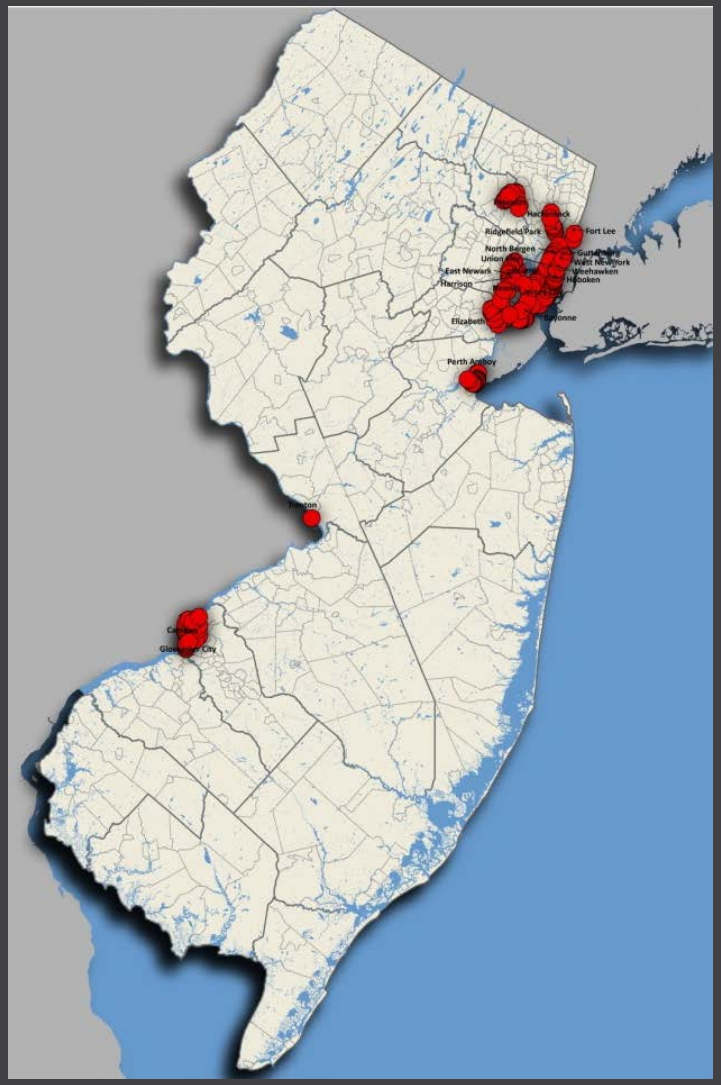


Access for All New Jerseyans?
Combined Sewer Overflows



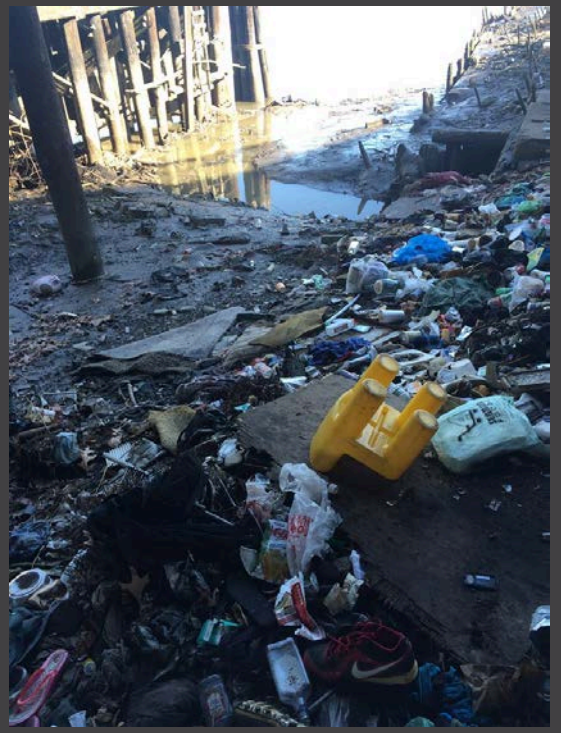
NEW JERSEY FUTURE

21 Cities with Promise



NEW JERSEY FUTURE

Dirty, Unsafe, Flooded, Nuisance



NEW JERSEY FUTURE

New Regulatory Requirements

- Permits issued in March
- “Long Term Control Plans” must be adopted in three to five years
- Decades-long implementation process
- Estimated cost: $4 – 13 billion

How Can We Make New Jersey's Water More Sustainable?

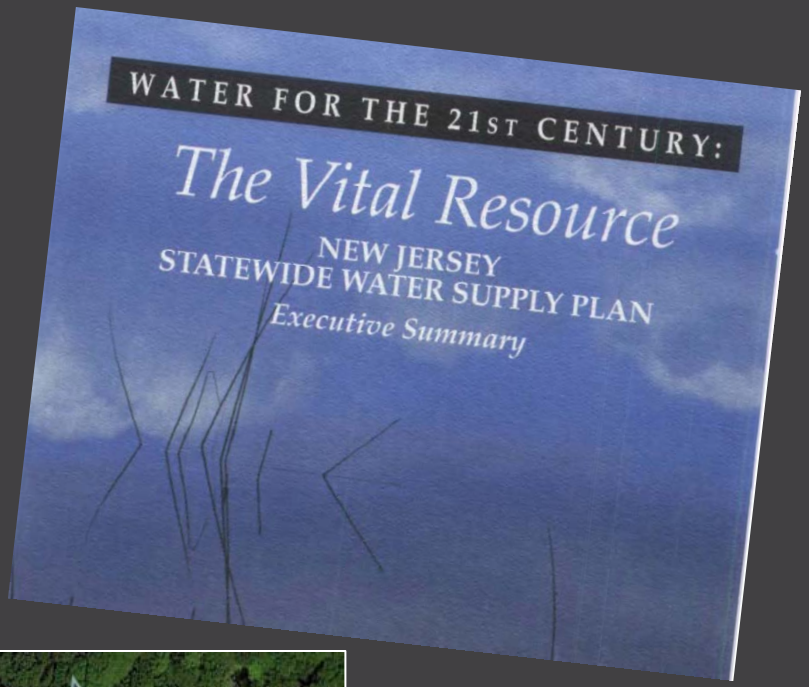
NEW JERSEY FUTURE

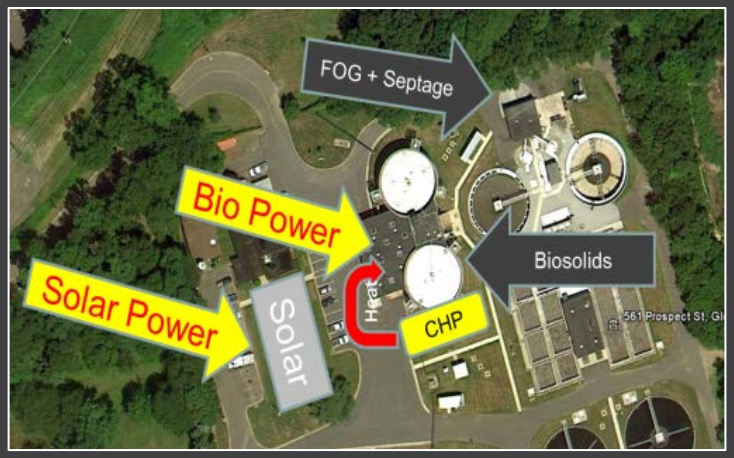
Reuse Reduce Recycle

- Water conservation for people and farms
- Fixing leaky pipes
- Reusing gray water

NEW JERSEY FUTURE

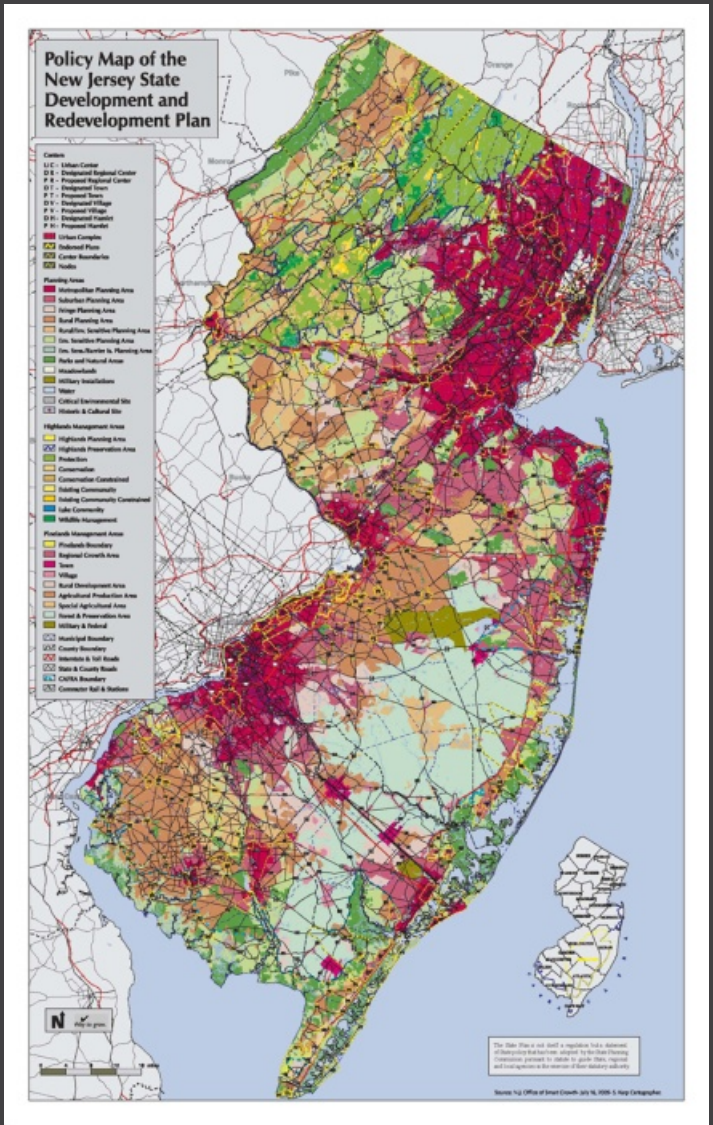
Treating Water as an Asset

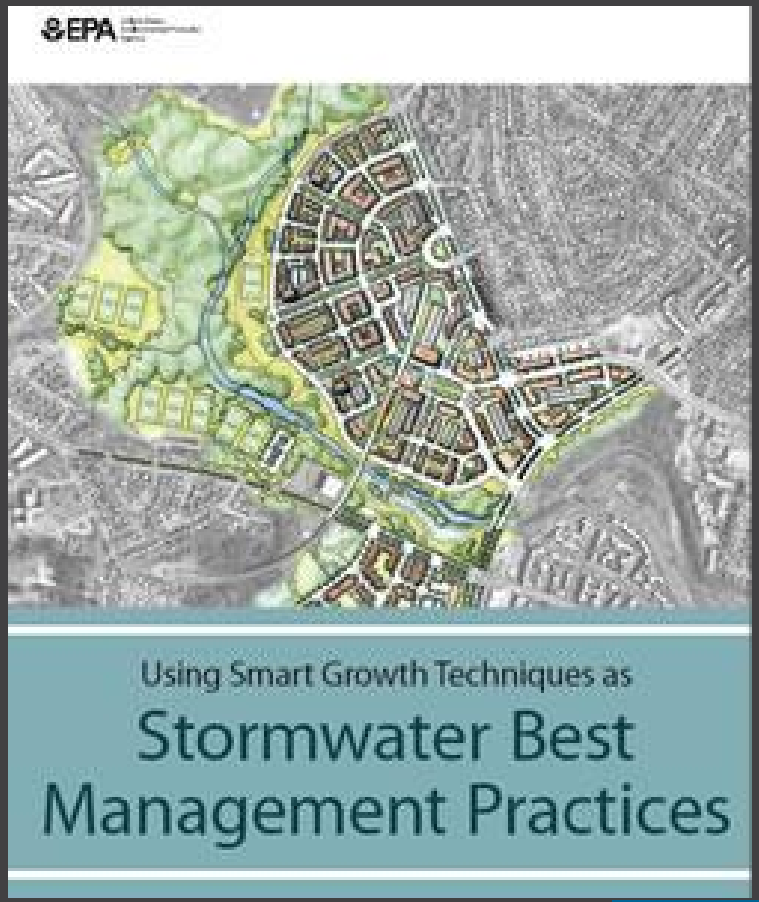




NEW JERSEY FUTURE

Planning for Where and How We Grow





NEW JERSEY FUTURE

Institutionalizing the Value of Water And Finding New Ways to Fund It

NEW JERSEY FUTURE

Raising Rates ,Maintaining Access

Using Networked Decision-Making to Change The Water System

Urban Water Working Group

www.njfuture.org/water

- Regulators
- Water/Sewer Utilities
- Cities
- Ratepayers
- Community Groups
- Environmental Groups
- Academia, Business

NEW JERSEY FUTURE

Making Green Infrastructure Standard Practice

- Engineers
- Designers and Landscape Architects
- Planners and attorneys
- Financiers

→

- Municipalities
- Developers

Job posting:
www.njfuture.org

NEW JERSEY FUTURE

Thank You

Resources

- www.njfuture.org/water
- Dan Van Abs, NJ Spotlight
- Charting New Waters
- NJDEP Clean Water Council and Water Supply Advisory Board
- Together North Jersey
- Your water and sewer utility!

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STORMWATER & GREEN INFRASTRUCTURE (& SOME WATER EFFICIENCY TOO): NATIONAL TRENDS AND NJ DEVELOPMENTS

LARRY LEVINE

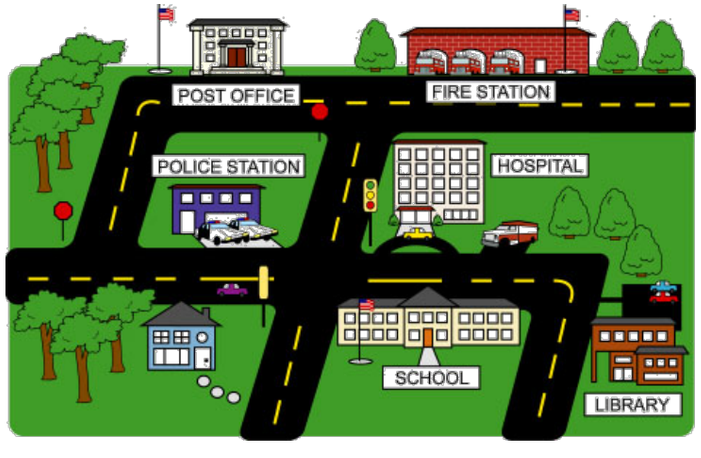
JUNE 10, 2015

2015 NEW JERSEY SUSTAINABILITY SUMMIT

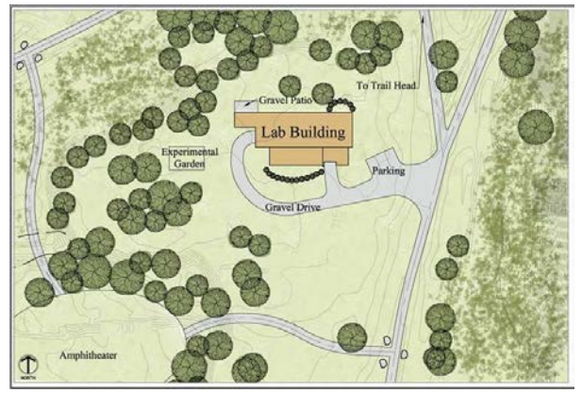
3-Level Approach to Stormwater Management

Region or Watershed

Neighborhood



Site



Growing Problem of Stormwater

- Shifting development patterns & corresponding loss of pervious surfaces
  - Development increases:
    - Stormwater volume & velocity; pollutant loads; stream channel erosion
  - Development decreases:
    - Health & safety of receiving waters; groundwater recharge; baseflow; stream habitat
- Aging & failing stormwater infrastructure
- Regulatory weaknesses
- Impacts from climate change and increasing population

Still Polluted, Even Without the Sewage

bacteria

trash

nutrients

heavy metals

pesticides

suspended solids

Urban Stormwater Runoff: Impairment

New Jersey Probable Sources Contributing to Impairments for Reporting Year 2012

Description of this table

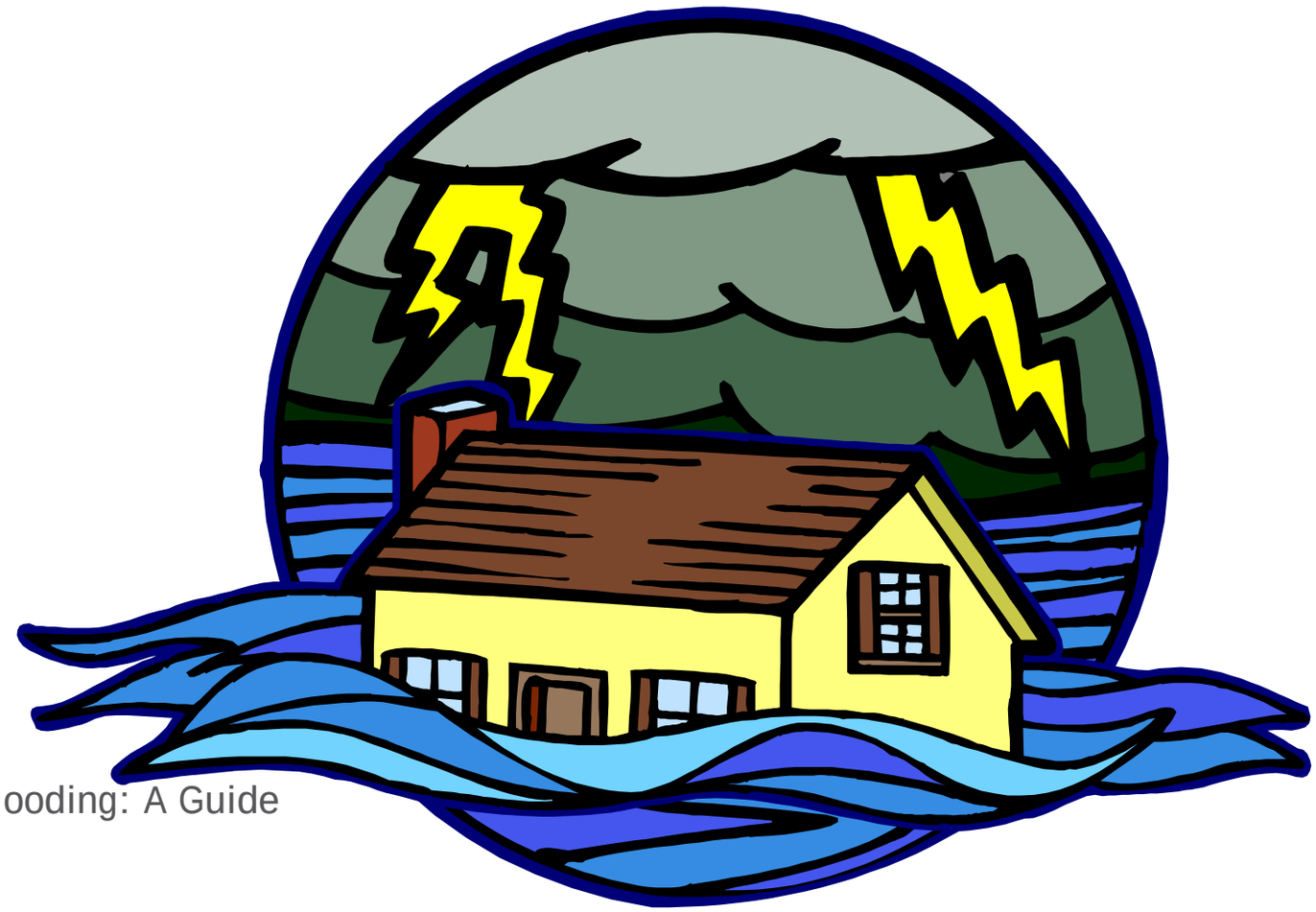
NOTE: Click on the underlined Probable Source Group to see a list of specific state Probable Sources making up the Probable Source Group.

Probable Source Group	Size of Assessed Waters with Probable Sources of Impairments				
	Rivers and Streams (Miles)	Lakes, Reservoirs, and Ponds (Acres)	Lakes, Reservoirs, and Ponds (Acres)	Bays and Estuaries (Square Miles)	Ocean and Near Coastal (Square Miles)
Agriculture	10,850.2	19,860.7	19,860.7	141.6	
Atmospheric Deposition	6,660.8	24,334.5	24,334.5	146.8	
Hydromodification	1,056.5	3,918.2	3,918.2	16.2	
Industrial	2,623.9	5,770.5	5,770.5	88.4	
Municipal Discharges/Sewage	3,034.9	6,592.3	6,592.3	9.3	109.5
Natural/Wildlife	527.0	2,507.4	2,507.4		
Unknown	1,361.2	2,642.5	2,642.5	43.3	
Urban-Related Runoff/Stormwater	13,093.9	26,865.9	26,865.9	193.7	371.9

According to EPA/NJDEP, 90% of assessed rivers and stream miles, 95% of assessed lake, reservoir, and pond acreage, 90% of assessed square miles of bays and estuaries, and 100% of ocean and near coastal waters in New Jersey not meeting at least one of their designated uses (such as swimming or fishing).

Urban Stormwater Runoff: Flooding

FEMA estimates that up to 25 percent of economic losses from flooding are the result of urban drainage, not from being located in a floodplain.



FEMA (2005).”Reducing Damage from Localized Flooding: A Guide for Communities.”

Green Infrastructure

Water quality management techniques

- green streets
- green roofs
- tree plantings
- rain gardens
- permeable pavement

© City of Toronto

Proven to help solve major urban stormwater problems and improve the health and livability of neighborhoods

Community benefits of green infrastructure

- Improving ***urban quality of Life***
- ***Beautifying neighborhoods***
- Increased ***property values***
- ***Cooling and cleansing*** the air
- Reducing ***asthma and heat-related illnesses***
- Lowering ***heating and cooling energy costs***
- Recharge ***groundwater supplies/improve conservation***
- Spurring ***economic revitalization***
- Creating ***green jobs***

Benefits of green infrastructure for private property owners

- Increased ***rents and property values***
- Increased ***retail sales***
- ***Energy savings***
- Stormwater ***fee credits*** and other financial incentives
- Reduced ***infrastructure costs***
- Reduced costs associated with ***flooding***
- Reduced ***water bills***
- Increased mental ***health*** and worker ***productivity*** for office employees
- ***Reduced crime***

RETAIL CENTER

The figures below present the key assumptions, proposed green infrastructure property improvements, and the resulting benefits for a midsize retail center.

GREEN INFRASTRUCTURE IMPROVEMENTS

40,000-sq.-ft. **green roof**, installed at the end of the life of the existing conventional roof, with green covering 90 percent of surface, or 36,000 sq. ft.

50 strategically planted **medium-size trees**, 25 opposite west-facing walls and 25 opposite south-facing walls

Bioswales and **rain gardens** that manage 1 inch of runoff from 2,000 sq. ft. of adjacent impervious area

72,000-sq.-ft. **permeable-pavement** parking lot

Cisterns to capture runoff from 5,000 sq. ft. of roof area and use for irrigation

BUILDING ASSUMPTIONS
(BEFORE IMPROVEMENTS)

SIZE	40,000 sq. ft.
STORIES	1
ROOF SIZE	40,000 sq. ft.
LOT AREA	128,000 sq. ft.
PERMEABLE AREA (COVERED IN TURF)	4,000 sq. ft.
NUMBER OF STORES	15
ANNUAL RENT	$17 per sq. ft.
ANNUAL RETAIL SALES	$2,182,000 per store

from: NRDC, *The Green Edge*

RETAIL CENTER

POTENTIAL BENEFITS

Energy savings due to reduced demand for heating and cooling	**$3,560** Annually
Avoided costs for conventional roof replacement	**$607,750** net present value over 40-year analysis period
Tax credit	**$100,000** one-time credit in year of installation
Increased **retail sales**	**$1.2 MILLION** per year
Stormwater **fee reduction**	**$14,020** Annually (projected to increase 6% per year)
Total present value benefits (over 40-year analysis period)	**$24,202,000 +** (including $22,963,800 in increased retail sales, which accrue to the tenants)

NON-QUANTIFIED BENEFITS

Water **conservation**	+
Increased **property value**	++
Reduced infrastructure costs due to use of permeable pavement system	+/U
Reduced crime	+/U
Improved **health and employee satisfaction**	+ (for tenants and employees)
Reduced costs associated with flooding	U

\+ would likely increase net benefits;
\+ + would increase net benefits significantly;
U direction of net change is uncertain.

Present value benefits over 40-year period were estimated on the basis of a 6 percent discount rate, projected CPI, projected increase in electricity and natural gas prices in relation to CPI (based on historical relationship), and 6 percent annual increase in stormwater fees. Improvements assumed to be implemented in 2015. Avoided conventional roof replacement costs were added to net present value of other benefits.Tax credit and stormwater fee reductions are based on available credits and fee structure in Philadelphia; many other localities have similar incentives.

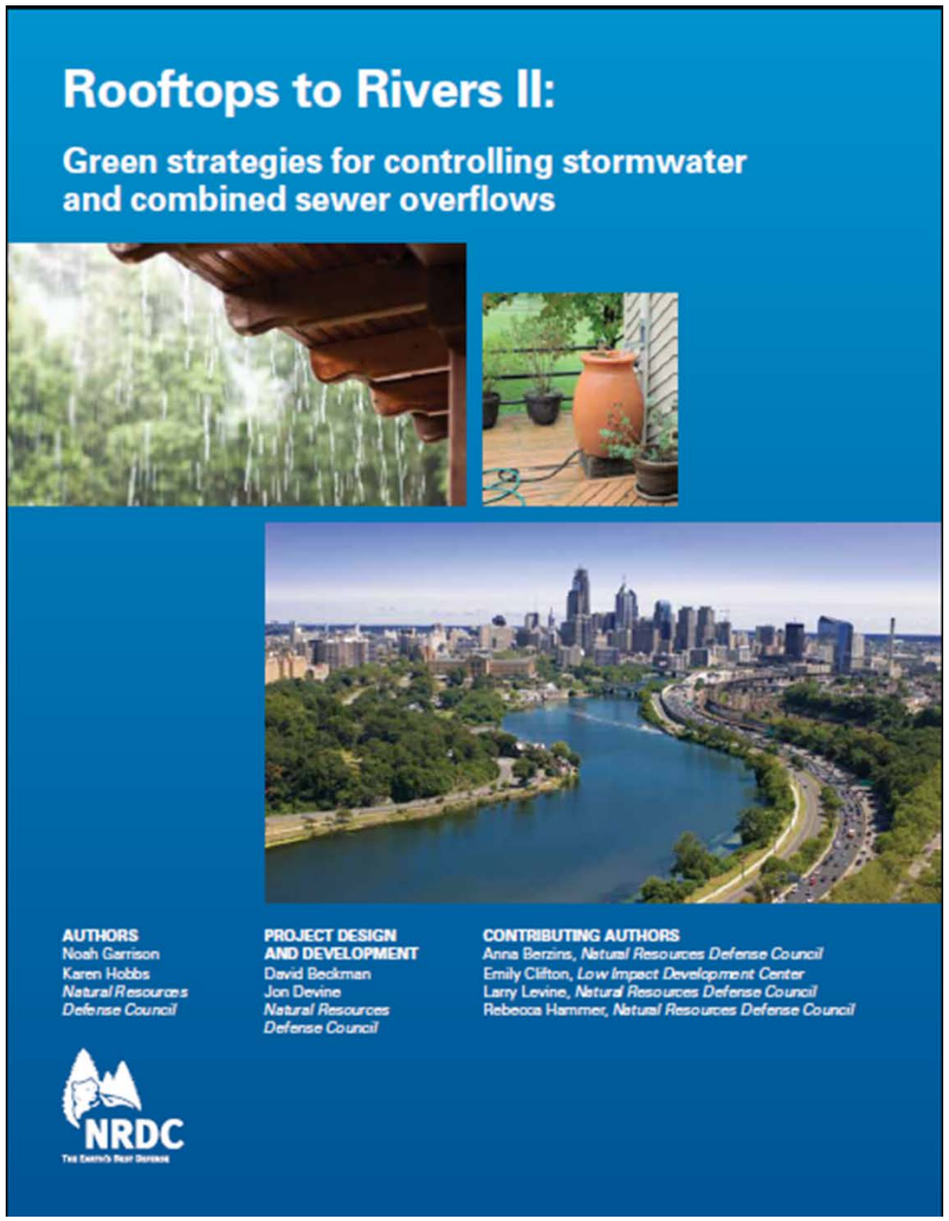
from: NRDC, *The Green Edge*

GI: What Cities Across America are Already Doing

•**2006**: NRDC releases *"Rooftops to Rivers,"* outlining how cities use green infrastructure to improve stormwater management and achieve multiple benefits

•**2011 & 2013**: NRDC updates and expands report, *"Rooftops to Rivers II,"* recognizing significant increase in understanding of multiple benefits & cost-effectiveness of green approach.

- 20 cities profiled; 14 in-depth case studies
- Key principles
    1. Plan
    2. Retain
    3. Replace
    4. Incent
    5. Guide
    6. Dedicate
- Economic benefits of green infrastructure
- Financing options for green infrastructure
- Policy solutions at local, state & federal levels



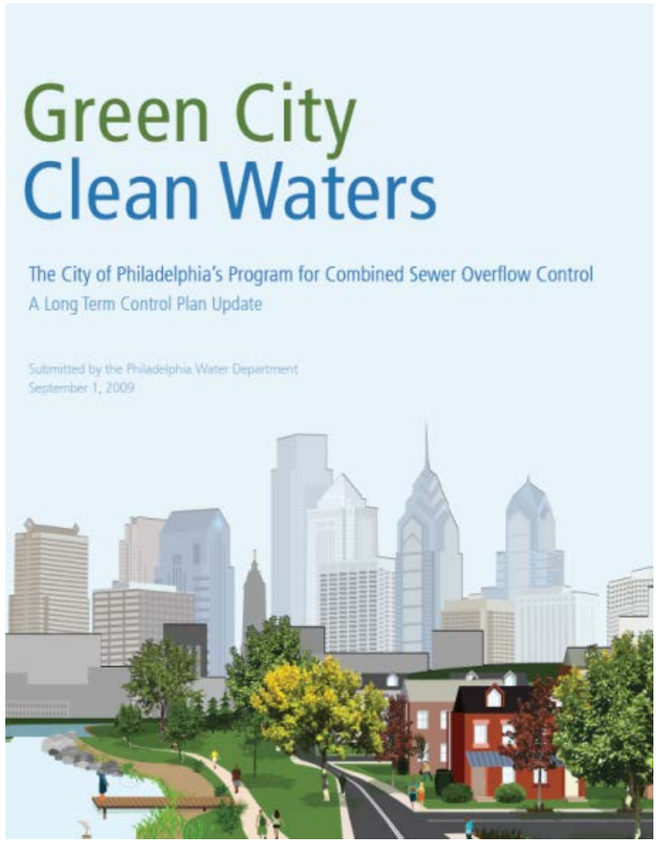
Philadelphia: *Green City, Clean Waters* (Before)

Philadelphia: *Green City, Clean Waters* (After)

Philadelphia: *Green City, Clean Waters*

"Green" approx. 10,000 acres over next 25 years

- Retain the first inch of stormwater over a third the city's impervious area within combined sewer area



Philadelphia expects to attain its "greened acre" goal thru combination of :

1. **Retrofits in public right-of-way (ROW)** -- managing stormwater from streets, sidewalks, and other publicly-owned impervious areas
2. **On-site capture standards for new & re-development**
3. **Incentives for private owners to voluntarily retrofit**
   - ✓ Relatively high stormwater fees (based on impervious area) can be reduced by 80%, if owner manages first inch of stormwater onsite
   - ✓ Low-interest loan program and grant programs cover upfront capital costs of voluntary retrofits

Where do the relevant laws come from?

- **Federal:** Clean Water Act (CWA) – Permits & Consent Orders/Consent Decrees
- **State:** Delegated CWA Programs + State Laws & Technical Guidance
- **Regional:** Interstate/Intrastate Watershed/Basin Commissions
- **Local:** Codes, Ordinances, Regulations, Guidance

Basic Clean Water Act Requirements for Stormwater Pollution

➢ Combined Sewer Overflows (CSOs)

- Long Term Control Plans
- Must be consistent with watershed pollution limits (“TMDLs”)
- Comply with water quality standards
- Post-construction monitoring

➢ Municipal Separate Storm Sewer Systems (MS4s)

- Reduce pollution to the “maximum extent practicable”
- Storm Water Management Plans
- Permits must be consistent with TMDLs
- Comply with water quality standards
- Monitoring

➢ SSO (Sanitary Sewer Overflow)

- Prohibition
- Reduce I/I (inflow/infiltration), etc.

➢ Opportunity to use EPA’s “Integrated Planning Framework”

➢ Plus: EPA rules require permitting (“residual designation”) for additional stormwater sources contributing to water quality standards violations or significantly contributing pollutants.

Waste Less, Pollute Less

NRDC ISSUE BRIEF

JUNE 2014
IB:14-06-A

Waste Less, Pollute Less: Using Urban Water Conservation to Advance Clean Water Act Compliance

Water Efficiency → Clean Water Goals

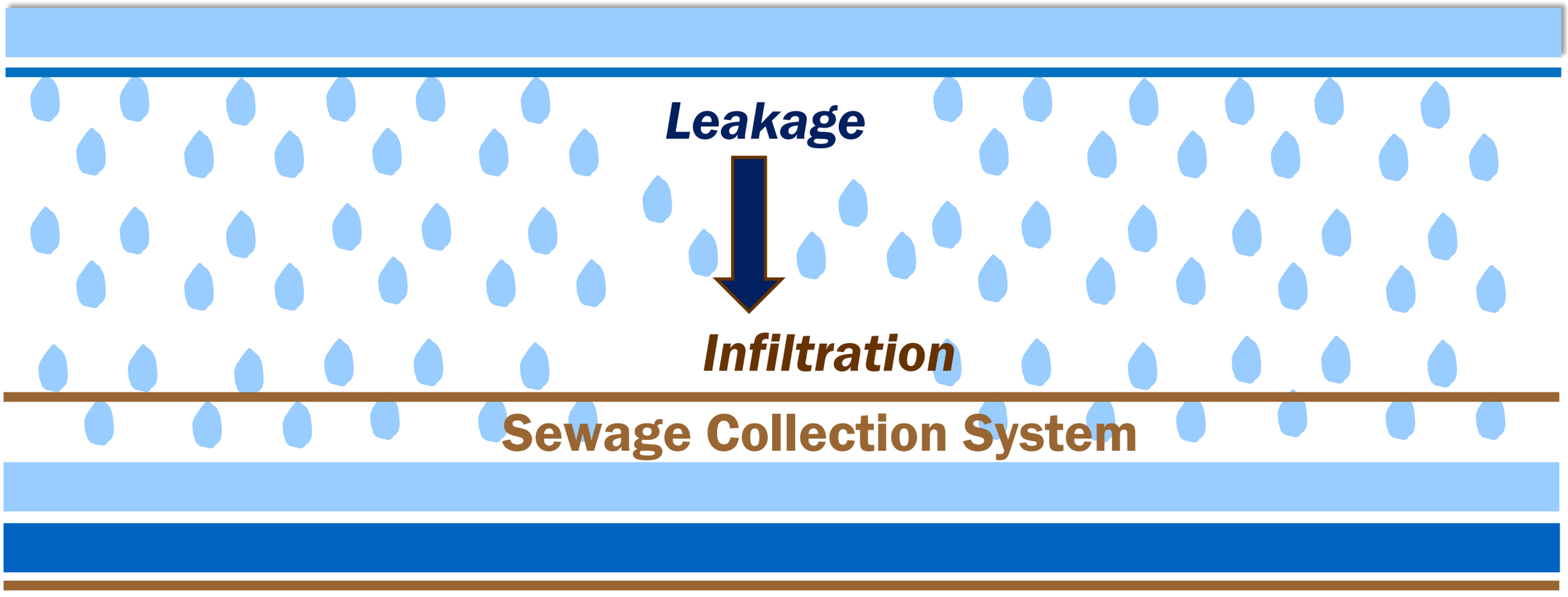
Reduce Indoor Water Use:

- Reduce strain on sewage collection/treatment systems
- Improve pollution control performance (wet weather & dry weather)
- Reduce compliance costs (capital and O&M)

Reduce Outdoor Water Use & Enhance Groundwater Supply:

- Native landscapes & rainwater harvesting are “green” stormwater infrastructure
- Regional groundwater recharge facilities capture runoff

Water Efficiency → Reducing I/I



Water Efficiency →
Right-Sizing Wastewater Infrastructure

U.S. per-capita/household indoor usage declining:

- **Fixture/appliance efficiency standards**
- **WaterSense market share**

Existing/planned local conservation efforts:

- **25% of 328 drinking water utilities nationwide predict at least a 15% reduction in demand**
- **6.5 % utilities predict 30% or more in reduction**

Don't over-build wastewater infrastructure based on outdated demand assumptions!

THANK YOU!

QUESTIONS?

More information at: www.nrdc.org/stormwater

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Water for our Future, Legacies from the Past

Chris Sturm, Senior Director of State Policy, NJ Future

Larry Levine, Senior Attorney, Natural Resources Defense Council

Donna Drewes, PP/AICP, Co-Director, Sustainable Jersey and Sustainability Institute at TCNJ

Where are we at Now?

Municipal Program

- Water Conservation Ordinance
- Water Conservation Education
- Rain Gardens
- Green Roofs
- Education- Rain Barrels
- Green Design

Schools program

- Impervious Cover Assessment & Plans
- Green Design

NEW Stormwater Ordinance

- Why was the ordinance updated?
  - To reflect advances in stormwater management since 2004
- Who worked on the updates?
  - NRDC facilitated a workgroup of environmental and watershed advocates, engineers, academics, planners
- Technical Provisions

Stormwater Ordinance Updates

The three most significant revisions:

1. Applicability of the ordinance (major, minor and redevelopment)
2. Stormwater retention requirement
3. Technical infeasibility provision

- *Note new ordinance would be preempted by Pinelands stormwater provisions*

Stormwater Ordinance Updates

Applicability of the ordinance

- What is “development”?
  - Now includes land disturbing activities
- What is “major development”?
  - Now includes redevelopment
  - Size threshold lowered
- Option of including “minor development”
  - For projects under the “major” size threshold

Stormwater Ordinance Updates

Stormwater retention requirement

- Major: Retain 1.25-inch, 2-hour rainfall event on-site using green infrastructure
- Minor: For each 250 sq. ft. of impervious surface, retain 450 gallons of runoff on-site using GI
- Relationship to existing recharge, quantity, and quality requirements

Stormwater Ordinance Updates

Technical infeasibility provision

- Alternative compliance: treat 1.5x the volume not recharged or retained on-site
- What conditions could lead to infeasibility?
  - Dense development conditions
  - High industrial pollutant loadings in runoff
  - Adverse hydraulic impacts to water table

Stormwater Ordinance Updates

But wait, there's more…

- Relationship to zoning approvals and building/construction permits
- Groundwater recharge volume calculation
- Neighborhood and regional scale practices
- Multiple drainage areas
- Maintenance of stormwater practices

New action posted in July 2015

Your thoughts?

- Are we focusing on the right things?
- Are there new initiatives, programs or best practices we need to be integrating into the program?
- Have we focused on the right goals and indicators for "Water"

Feedback welcome-

Follow up survey & opportunity to participate in Webex call on June 17 from 11-12 am