



**Environmental  
Protection**

# **Cease the Grease**

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**Love Your Sewers**

A Teacher's Guide and Classroom Resource

- About DEP
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- Water Distribution
- Water Consumption and Population
- Diagram of the Water Supply & Wastewater Systems
- Sources of Wastewater
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## About Department of Environmental Protection (DEP)

DEP protects public health and the environment by supplying clean drinking water, collecting and treating wastewater, and reducing air, noise, and hazardous materials pollution.

### Quick facts about DEP:

- Distributes more than 1 billion gallons of clean drinking water each day
- Collects wastewater through a vast underground network of pipes, regulators, and pumping stations
- Treats the 1.3 billion gallons of wastewater that New Yorkers produce each day

For more information, visit

[www.nyc.gov/dep](http://www.nyc.gov/dep).



**View of the digester eggs at the  
Newtown Creek Wastewater Treatment Plant**

# Water Supply



We use water for:

- Drinking
- Cooking
- Laundry
- Showering
- Flushing toilets

How else do you use water?

The average freshwater consumption in NYC is 75 gallons per person per day.



A total of 1 billion gallons of safe drinking water is provided to NYC daily.

## New York City's Water Supply System



### Croton Watershed

- First reservoir was built in Central Park in 1842
- Supplies 10% of NYC's water

### Catskill Watershed

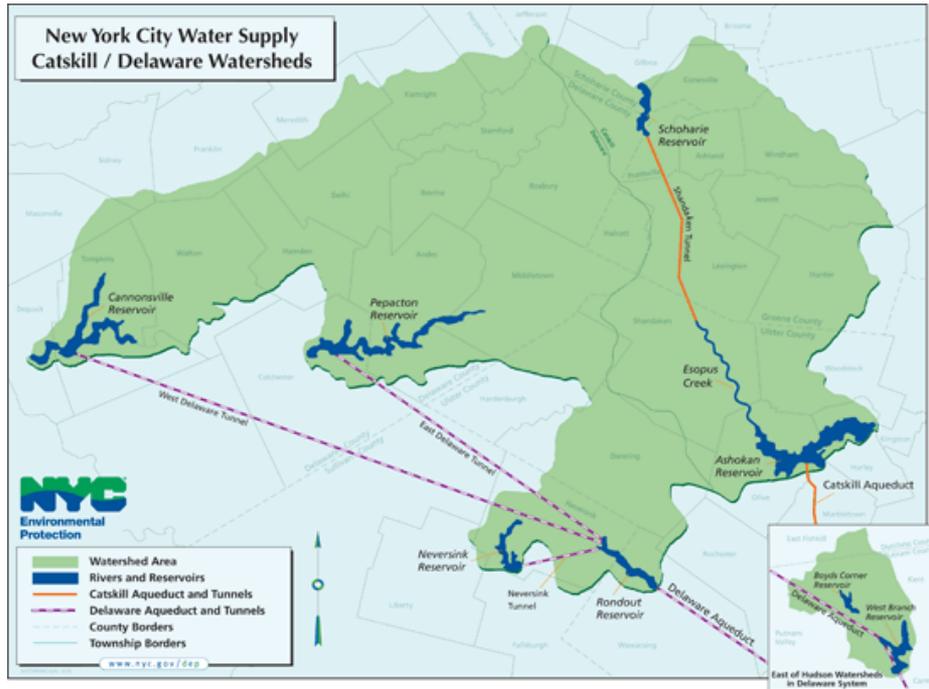
- Built between 1907 and 1927
- Supplies 40% of NYC's water

### Delaware Watershed

- Built between the 1920s and 1960s
- Supplies 50% of NYC's water

Our water supply system includes 19 reservoirs and 3 controlled lakes, with a total storage capacity of around 580 billion gallons.

# Water Supply



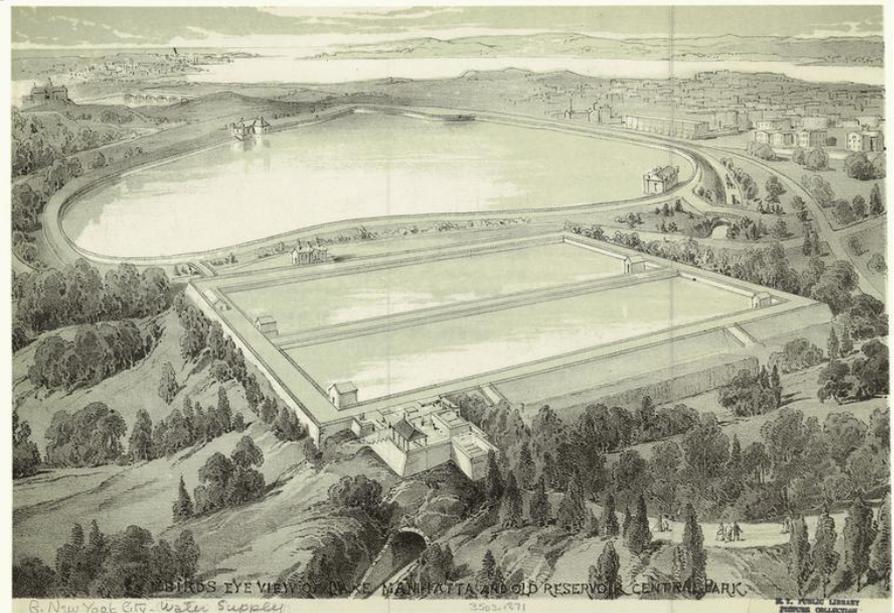
The watersheds have a combined area of nearly 2,000 square miles. NYC has secured more than 130,000 acres of land in the watersheds, creating an ecological buffer to protect the water from contamination.





## ← **Pepacton Reservoir**

**Croton Lower Reservoir** in the foreground and **Jacqueline Kennedy Onassis Reservoir** in the background. Croton Lower Reservoir was filled in to create the Great Lawn in Central Park.



## ← **Ashokan Reservoir**

# Water Distribution



Water travels from the watersheds through large pipes called aqueducts and water tunnels.

95% of the water is transported by gravity, only 5% of the water is regularly pumped to maintain water pressure.

## Construction of the **Catskill Aqueduct**





## New Croton Aqueduct

- placed in service in 1890

## Catskill Aqueduct

- completed in 1915

## Delaware Aqueduct

- completed in 1944

## City Water Tunnel No.1

- operating without interruption since 1917

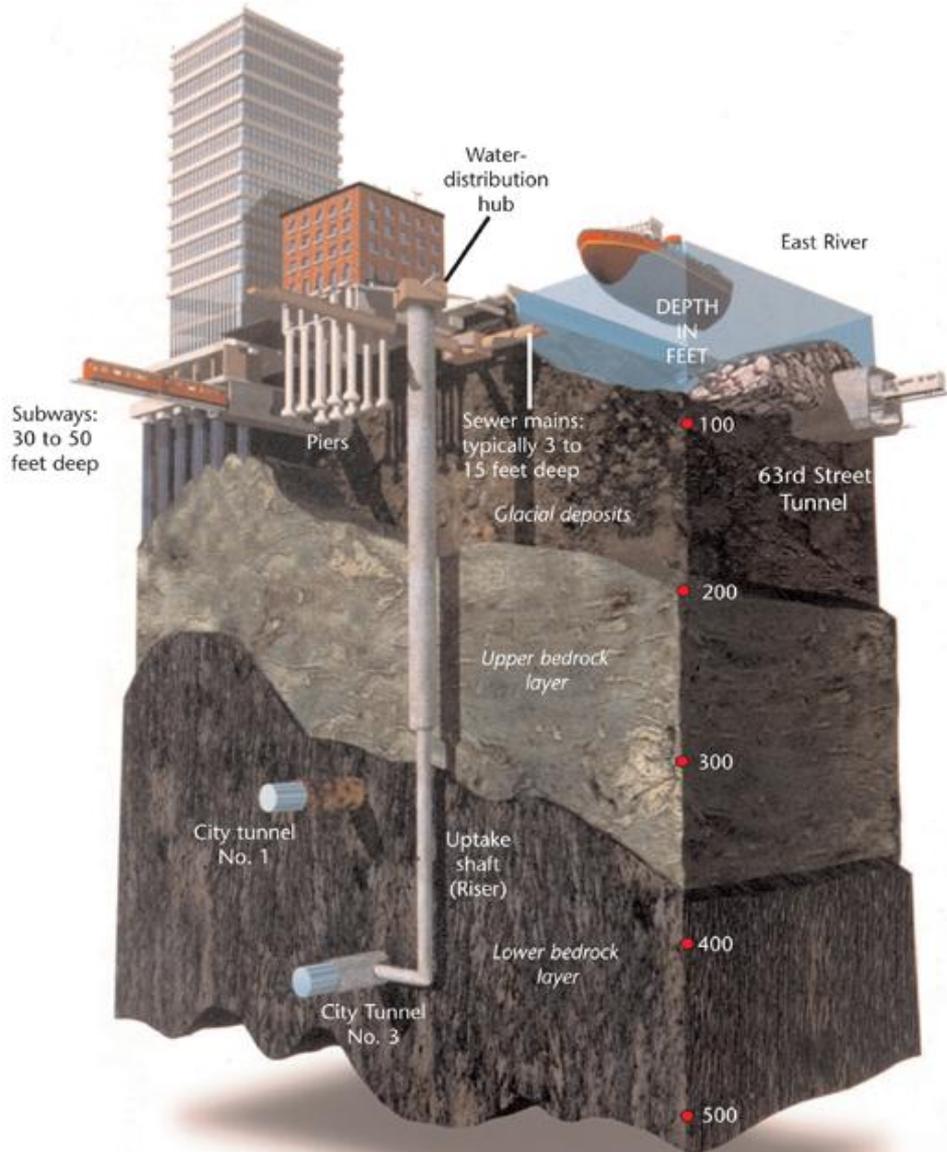
## City Water Tunnel No. 2

- operating without interruption since 1936

## City Water Tunnel No. 3

- Construction began in 1970
- Will reduce dependence on the older tunnels and provide infrastructure redundancy
- Currently 22 miles long

# Water Distribution



## City Water Tunnel No. 3

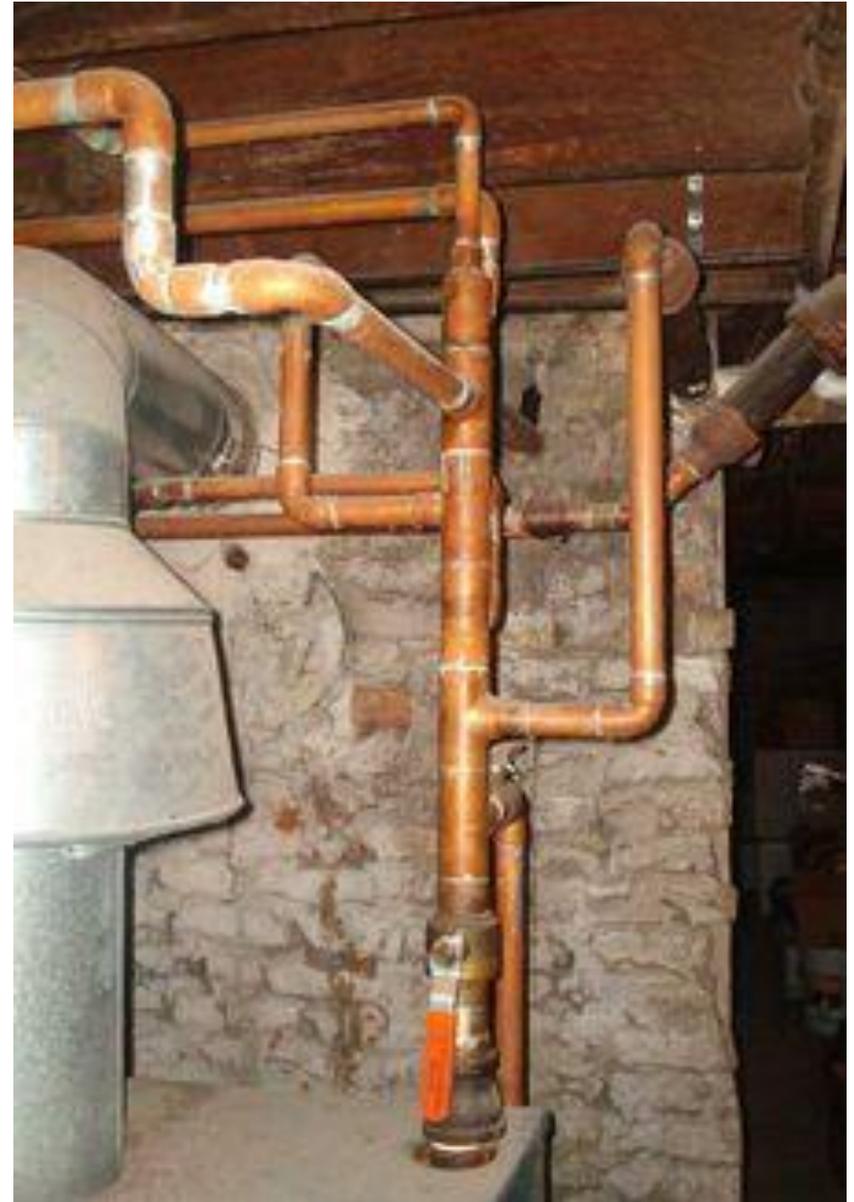


**City Tunnel No. 3**  
**Rendering**

# Water Distribution

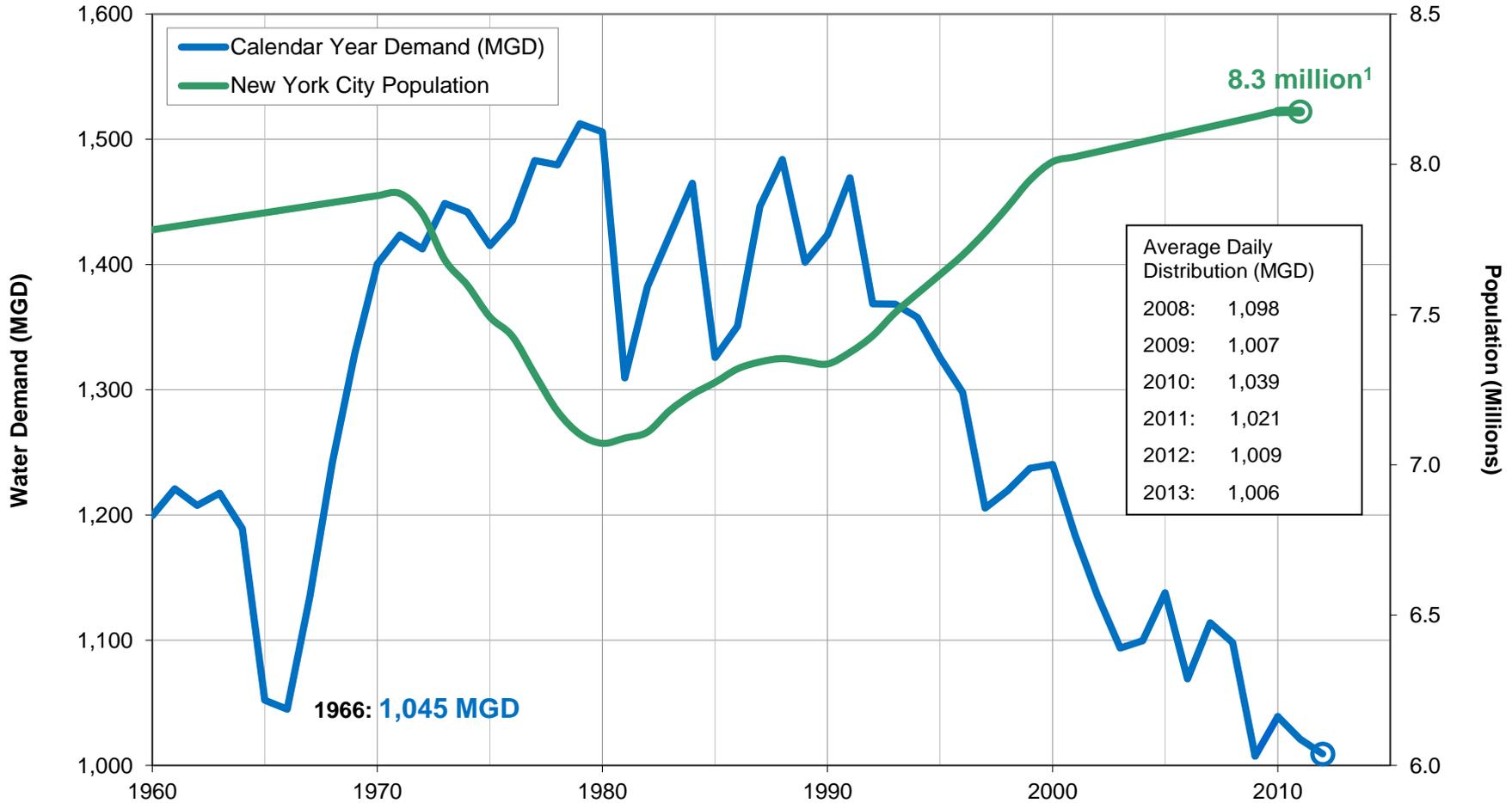
City Water Tunnels feed water into water mains, a network of underground water pipes that deliver water to the points of consumption. Hidden beneath our feet in NYC are 6,800 miles of water mains.

More than 100 years ago, wooden water pipes, made from hollowed-out pine and spruce trees, transported water under our city streets.



# Water Consumption and Population

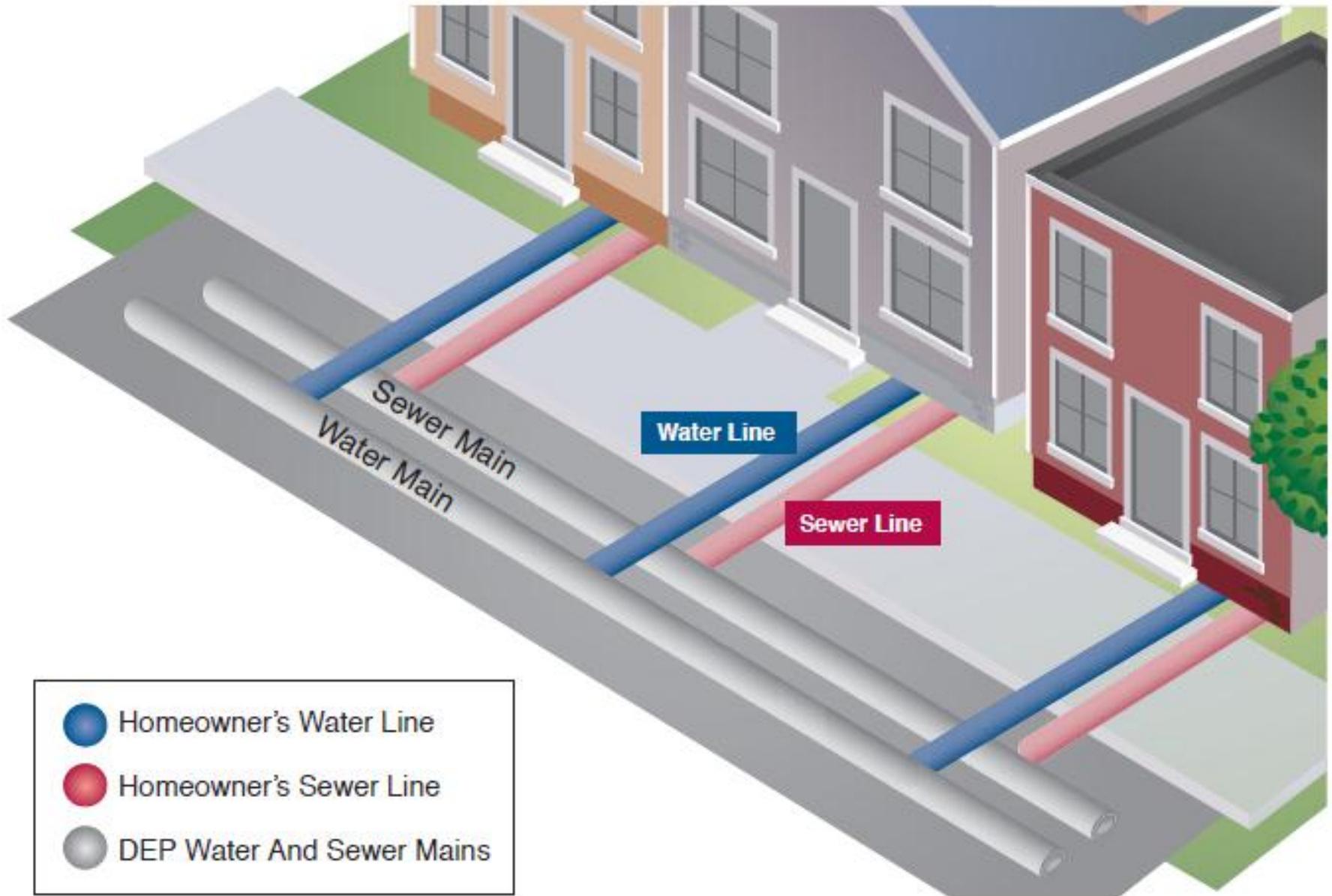
Distribution has declined approximately **30%** since the early 1990s – despite increasing population.



<sup>1</sup> Official 2012 New York City Department of City Planning Estimate.

Since 2009, water usage has been below the 1960s drought-of-record.

# Water Supply & Wastewater Systems



# Sources of Wastewater



# Sources of Wastewater



Wastewater is collected by the sewer system, which brings wastewater to wastewater treatment plants.

Most of NYC has a combined sewer system, which collects both sanitary sewage and stormwater runoff.





This sewer is under construction in the Bronx → (1939)

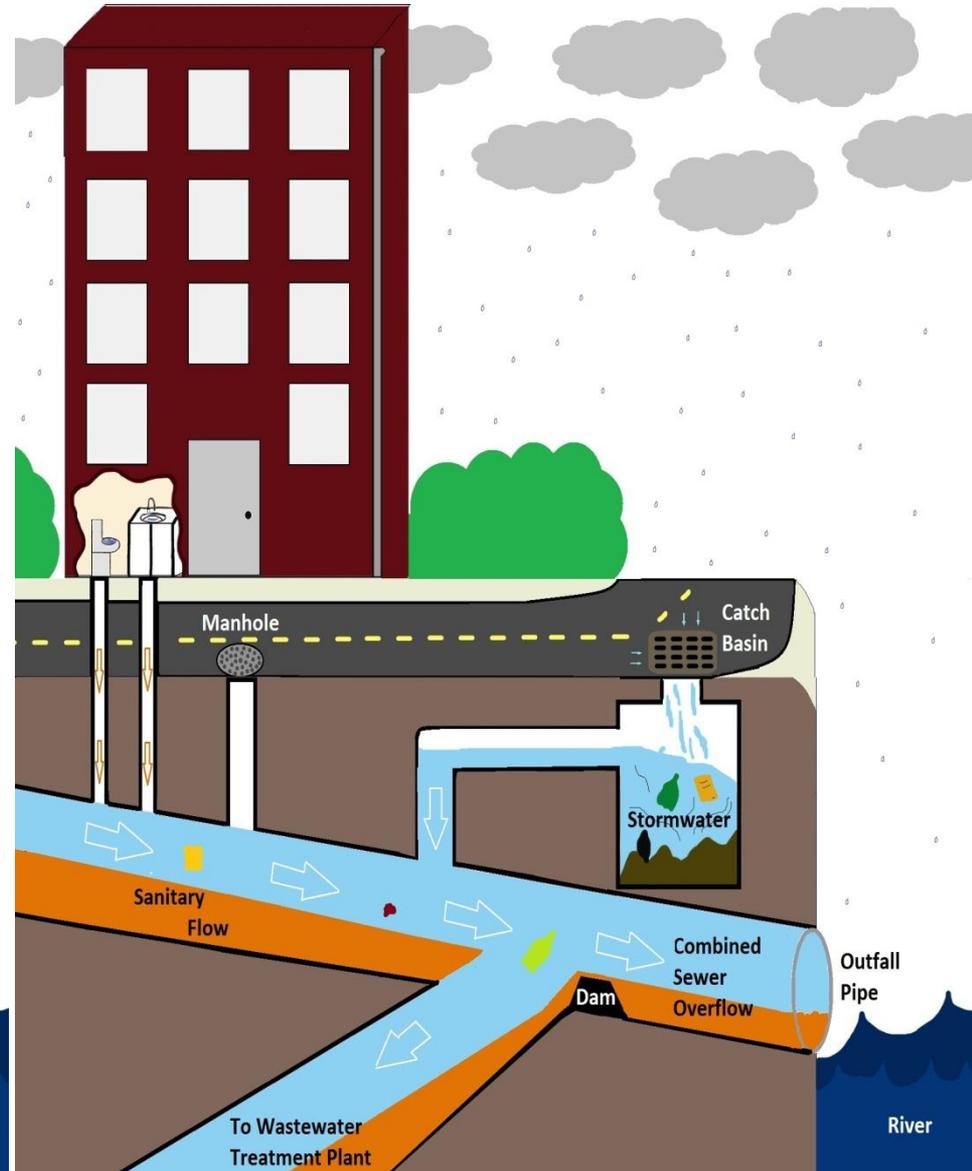
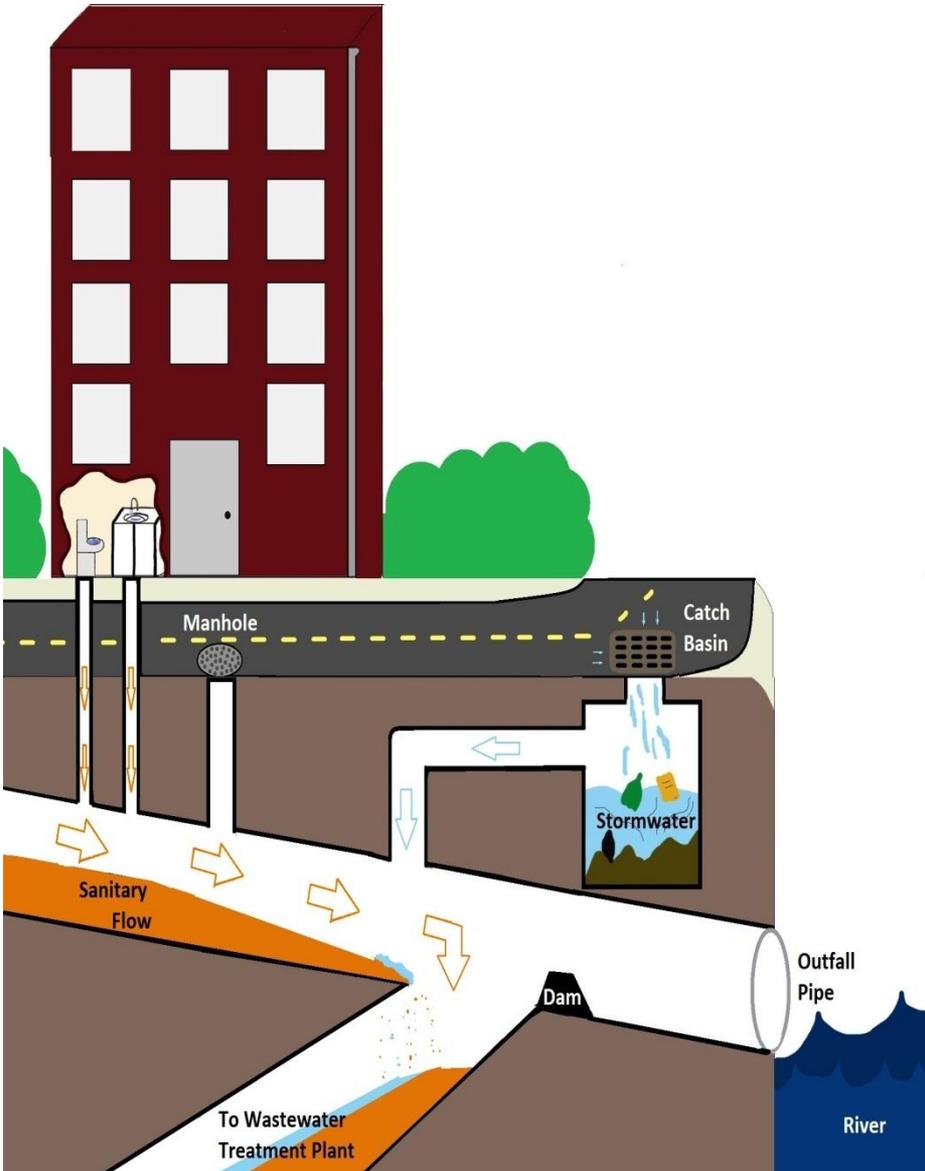
Before the construction of sewers, waste was simply discarded onto the streets and into waterways. Today, more than 7,400 miles of sewers safely and invisibly convey beneath the city's streets.

# Sewers

A closer look at a combined sewer system...

Dry weather

Wet weather (heavy rainstorm)



# Wastewater Treatment



The sewer system brings wastewater to NYC's 14 wastewater treatment plants.

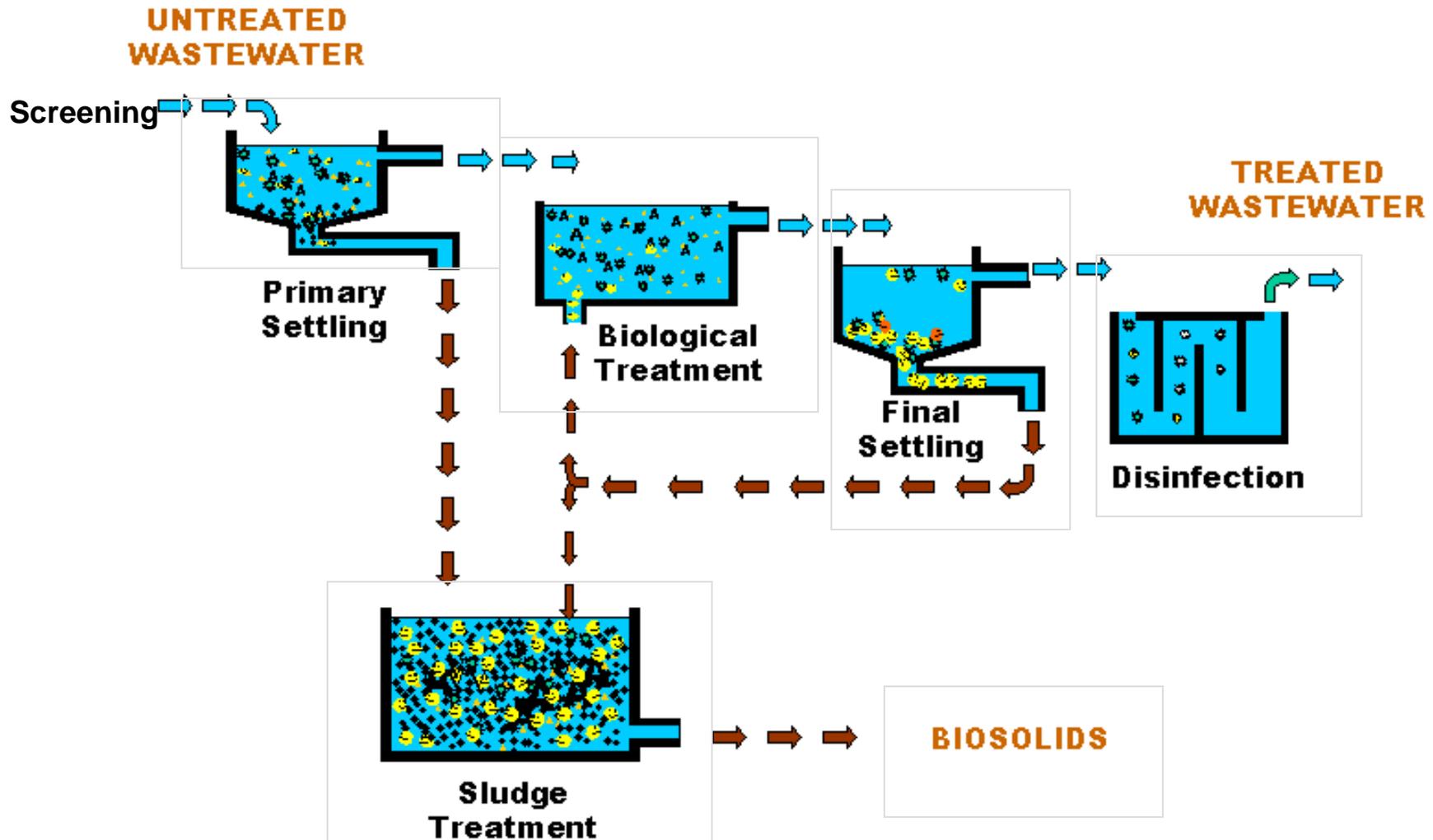
Approximately 1.3 billion gallons of wastewater is treated every day in NYC.

At the plants, physical and biological processes closely resemble how wetlands, rivers, and lakes naturally purify water. These plants only take 7 hours to remove most pollutants, while this process could take more than 3 weeks in nature.

Primary and secondary treatment remove between 85% to 95% of pollutants from wastewater before the treated wastewater is disinfected and discharged into local waterways.

# Wastewater Treatment

## Treatment Process Overview



True or False?

Cooking oil and grease should be poured down the drain.

**False**

Cooking grease poured into a drain can clog pipes in your home and sewers too.

# The Grease Problem

Liquefied fat, oil, or grease (FOG) that is poured down the sink can cling to the insides of pipes and sewers. Over time, it can build up and block pipes completely. Our sewers are crucial to NYC's wastewater treatment system, but FOG can prevent them from operating normally.



**Sewer with Grease**



**Sewer without Grease**

# The Grease Problem



Cooking grease poured down the drain can clog sewer lines. If wastewater can't move freely through pipes and through the sewer system, sewage back-ups and flooding can occur.



Sewage back-ups into homes can cause unsanitary conditions and expensive damages.

Clogged sewers can also increase the chances of combined sewer overflow events, in which untreated wastewater is released into waterways, adversely affecting water quality and the environment.

# Sewer Maintenance



Sewer inspectors check for cracks, holes, grease accumulation, and other defects that will need to be fixed. Remote controlled cameras are also used to inspect sewers.

Some sewers are as deep as 70 feet below ground. They can be as narrow as 6 inches in diameter or as wide as 31 feet in diameter.

# Sewer Maintenance



Vactor trucks loaded with powerful vacuum systems are used to clean the sewers. They can suck out accumulated debris, sediments, and grease.



**Before**

**After**



## You Can Help Take Care of NYC's Sewers and the Pipes in Your House.



- Put food scraps into the garbage or a container to prevent FOG from going down the drain. Wipe off any excess residue with paper towel.
- Use a strainer in your kitchen sink to catch food scraps before they go down the drain.



- Do not pour grease or cooking oil down the sink or toilet.
- Do not wash left-over foods down the drain; they can clog your drain too.
- Hot water and detergents that claim to dissolve grease only move the grease further down the line where it can cause problems in another area of the sewer system.

# Cease the Grease

Do not pour grease or cooking oil down the sink or toilet.

Instead, pour them into a container - an empty coffee or soup can will work well. Wait until the liquids cool and collect enough until the container is full, then dispose of it in the garbage.



**Proper  
Grease  
Disposal**



# Cease the Grease



Click [here](#) for more grease disposal tips from DEP.

**Love NYC.  
Love Your Sewers.**



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Protection**

Visit DEP's  
Website at

[www.nyc.gov/dep](http://www.nyc.gov/dep)

