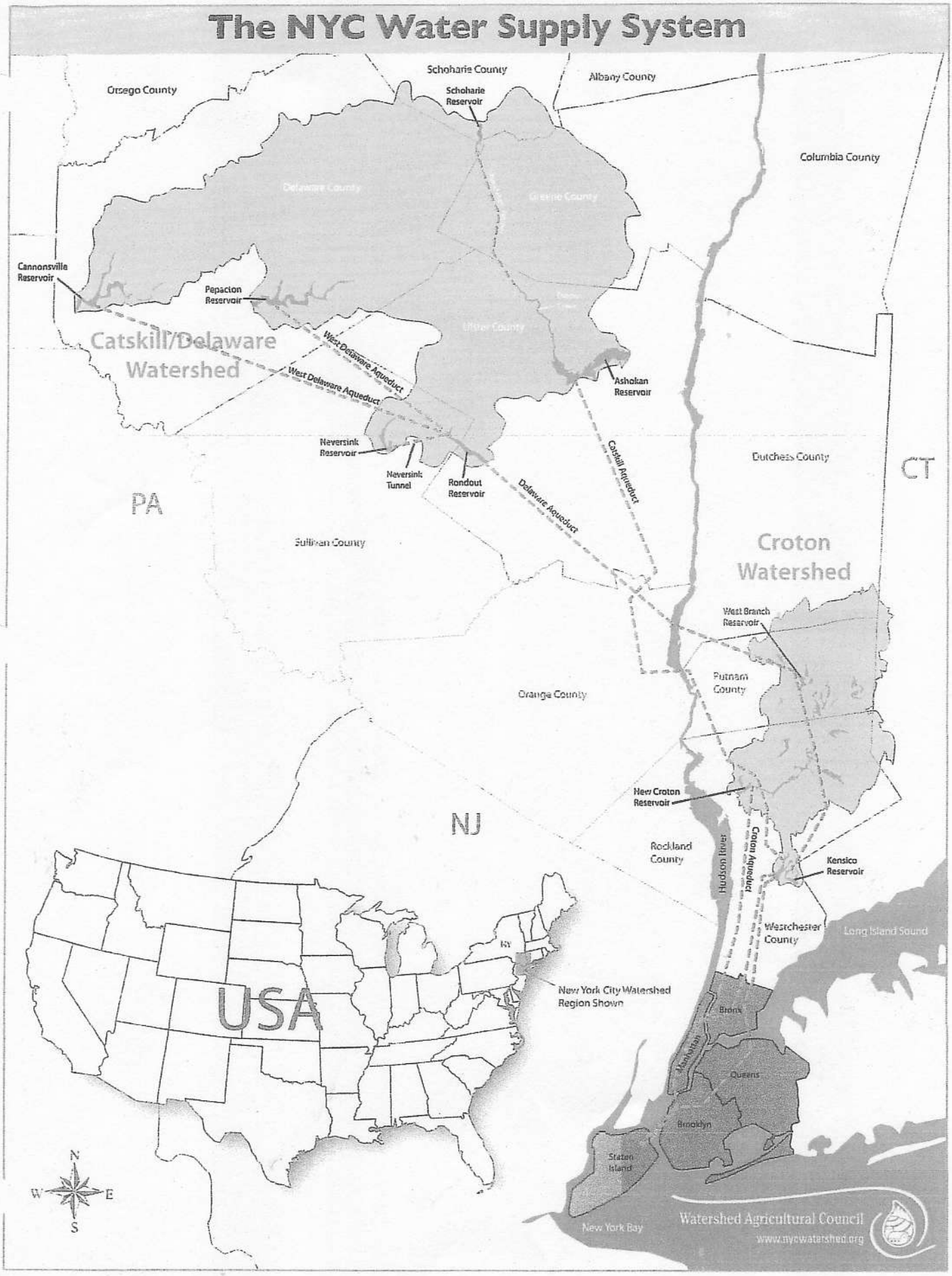
The NYC Water Supply System



Watersheds & Working Landscapes: The NYC Water Supply System

What are watersheds?

- The land area that sheds all of its surface water into a common body of water (such as a stream, river, lake, reservoir) is called a watershed.
- Every body of water has its own watershed.
- All of the earth's land drains into some body of water ... therefore we all live in a watershed.

What is the NYC water supply system?

- NYC's water supply comes from reservoirs within watersheds in upstate NY - the older Croton Watershed and the newer Catskill/Delaware Watersheds.
- 19 reservoirs and 3 lakes supplies 8 million NYC residents and visitors and 1 million more upstate with 1+ billion gallons of water per day.
- Thousands of people in dozens of communities were forced to move to make way for the City's 13 collecting reservoirs and buffer zones.
- The water travels up to 125 miles through large underground tunnels and aqueducts to reach NYC.
- On average 90% of NYC's water is supplied by the Catskill/Delaware Watersheds which are currently unfiltered.

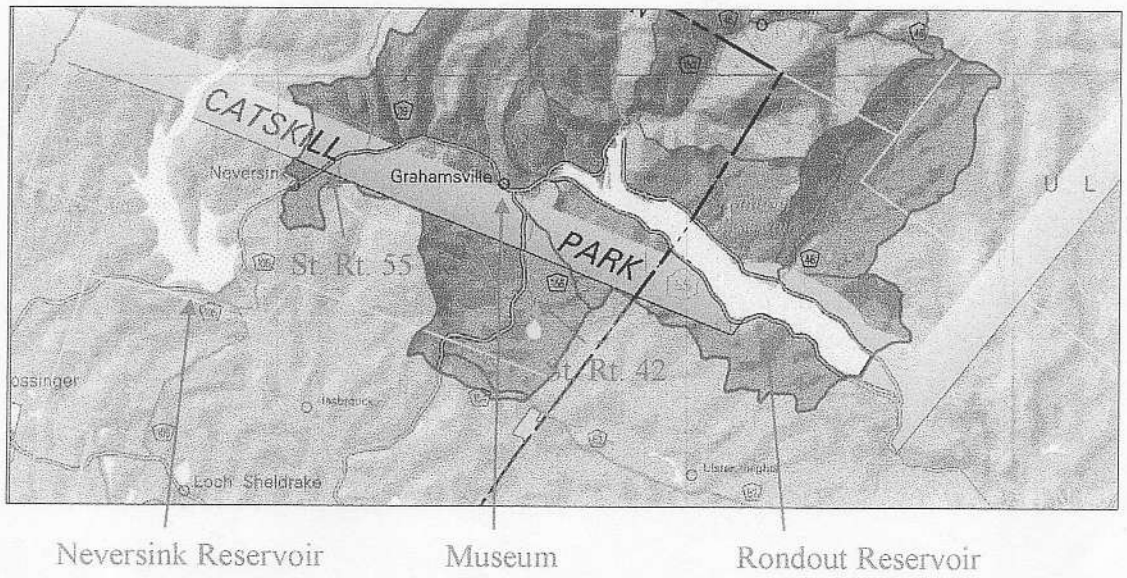
What are working landscapes?

- A working landscape is a landscape which can support and balance a variety of economic, ecological, and social needs by taking into account the residents who live/work in the landscape as well as non-residents who rely on the land for goods and services.
- Approximately 75% of the NYC watershed landscape is forestland and farmland covers 7-10%. The remainder is developed.
- 71% of the NYC water supply watersheds are privately owned. 17% is owned by NYS (Catskill Forest Preserve) and NYC owns 12% (reservoirs, buffer lands, recreational lands).
- 250,000+ people live in the NYC Watersheds, most of them in the Croton Watershed, in suburban Westchester and Putnam Counties.
- NYC works in partnership with upstate watershed consituents to protect and preserve water quality in the watersheds through well managed forestland and farmland - working landscapes.

Why are working landscapes important for watershed protection?

- Well-managed farms and working forests are a preferred land use for watershed protection.
- A "working" landscape provides multiple benefits:
  - jobs
  - food
  - wood products
  - safe drinking water
  - rural character
  - recreation & tourism opportunities
  - biodiversity
  - community economic viability
  - open space

Rondout and Neversink Reservoirs



Neversink Reservoir

Construction Began: 1941
Construction Completed: 1953 Filling began on June 4, 1953 and it took two years to completely fill.

S.A. Healy Company from Chicago, Illinois constructed the reservoir and dam. The dam's cut off wall is eight feet wide at the bottom, four feet wide at the top and 166 feet tall. The earthen structure containing the cut off wall is 1500 feet wide at the base, 60 feet wide at the top, 200 feet high, and 2800 feet long. The dam is made up of seven and one half MILLION cubic yards of compacted soil and one million cubic yards of rock.

The reservoir is five miles long and one half mile wide. It holds 35 billion gallons of water.

Rondout Reservoir

Construction Began: 1937, Construction Completed: 1951

The Rondout Reservoir is the key structure in the Delaware System. It is the receiving basin for the three other Delaware system reservoirs – the Cannonsville, Pepacton and Neversink Reservoirs, and also houses the control works that regulate all water entering the Delaware Aqueduct. **The Rondout Reservoir can hold 50 BILLION gallons of water.**

Because of excessive ground water, the dam required a concrete core to prevent leakage. A series of connected caissons made from heavily reinforced concrete make up the concrete core. Using diesel powered earth moving construction equipment, workers compacted earth and earth materials around the core.

What is a caisson? A watertight chamber used to carry out construction work under water.

The name of this dam changed from Lackawack (after the town located there), to Merriman after the death of Thaddeus Merriman, the Chief Engineer from 1922 to 1933.

Are the following facts about water **True** or **False**?

Activity: Circle the correct answer.

1. About 2/3 of your body is made up of water.
   True False
2. Water can be found in the form of a liquid, a solid and gas.
   True False
3. There is water vapor in the air you breathe.
   True False
4. When water evaporates it rises into the air as a solid.
   True False
5. Energy is needed to pump the water from upstate reservoirs to New York City.
   True False
6. The higher up you go, the hotter the air is.
   True False
7. There is much more water today than there was millions of years ago.
   True False
8. A reservoir is where water is stored. An aqueduct is a tunnel that brings water to a city from far away reservoirs.
   True False
9. The water cycle is when water evaporates from lakes and oceans, forms clouds and then returns to earth as rain or snow.
   True False
10. New York City has three reservoir systems - the Delaware, the Catskill and the Croton. Scientists test the water there every day to make sure it is clean.
    True False
11. Clean water is not important for our health.
    True False
12. Everyone can save water at home by taking shorter showers, turning off the faucet when not in use and telling family and friends about the value of water.
    True False

Answers: 1.T 2.T 3.T 4.F 5.F 6.F 7.F 8.T 9.T 10.T 11.F 12.T

WATER WORD MATCHING

Activity: Ms. Frizzle always likes to match the clothes she is wearing with the lesson or activity that she is teaching. Test your matching skills and match each water word with its best fit definition.

1) RAIN	A force that pulls water down hill. (A)
2) WATER	An area where water is stored. (E)
3) EVAPORATION	Mist created by cold, rising water vapor. (L)
4) WATER VAPOR	Pipes under the city that lead into buildings. (R)
5) CLOUD	The only substance that can be found as a solid, gas or liquid in nature. (E)
6) STREAM	The control center of a reservoir. (T)
7) WATER CYCLE	When a liquid changes into a gas. (A)
8) RESERVOIR	Dirt, germs or dust particles that are found in water before cleaning and filtering it. (D)
9) IMPURITIES	When large water droplets are pulled out of the clouds by gravity. (W)
10) AQUEDUCT	Water that flows downhill on top of the ground. (N)
11) GRAVITY	An invisible gas that is made up of water.(L)
12) GATEHOUSE	Large tunnel that brings water to a city from far away. (W)
13) CHLORINE	The natural process that keeps water moving between the rivers, lakes, oceans and the clouds. (E)
14) WATER MAINS	A chemical that is added to the water to kill off some germs and make water safe for drinking. (E)

You can keep track of the words you have matched by writing the letter that is in parentheses over the number of the word that you solved. If you got them all correct, you will hear what Liz the Lizard says!

___	___	___	___	___	___	___	___	___	___	___	___	___	___	___
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	

P M A E R T S B G T

X O B F L A K E H R

W T L I D J O Q T E

P A X L L L E W L A

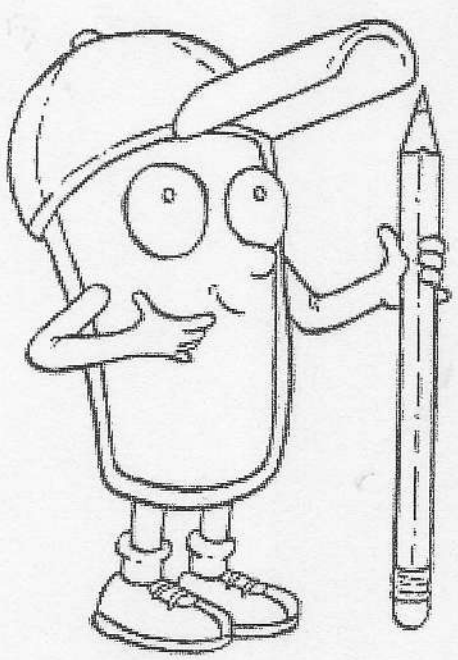
I N T T U G V P U T

P F O E Y T D W C M

E V S R R A I M K E

S T R Z B N P O Y N

N E F A S K W A N T



Find and circle these words:

STREAM	WELL
FILTER	TREATMENT
PIPES	TANK
SAFE	POLLUTION
WATER	LAKE