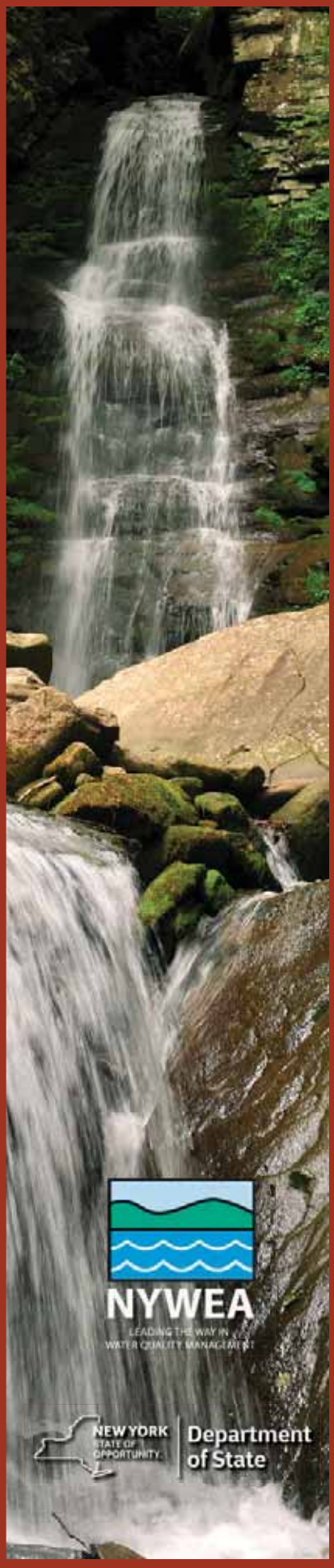
NYC Watershed Science and Technical Conference

September 9, 2015 Thayer Hotel, West Point

On-Site Program



Welcome!
2015 NYC Watershed Science and Technical Conference "Year of the Operator"
September 9, Thayer Hotel, West Point, NY

Each year, one of our conference goals is to provide a broad-based look at current scientific and technical trends in water and wastewater science and technology. In doing so, we hope to remind ourselves and our conference attendees of the diversity and complexity of how water comes and goes.

As we were assembling the components of this year's program, we were mindful of the fact that this year has been named the "Year of the Operator", in recognition of the very important and technically complex work that water and wastewater operators accomplish for all of us each day.

Operators across the country perform extraordinary and important functions around the clock, every day. Through a careful and highly trained approach to the tasks, water and wastewater plant operators perform life sustaining functions: bringing us clean drinking water, and after our use, managing its return safely to the environment.

Operators are unsung heroes. Most people don't think about where their water comes from, or where it goes. We just trust that it will be there for a hot shower or to fill a canteen for a hike. Water is always there for us because of the highly technical and careful approach taken by operators to one of the most important jobs on earth.

Part engineers, part chemists, part mechanics, part mathematicians, water and wastewater operators walk a daily tightrope between disinfection and its by-products, and between waste disposal and environmental protection. Testing, repairing, adjusting, monitoring and responding to emergencies are all in the daily log for operators.

And so it is appropriate to thank our hard working operators, and to reflect on the incredibly valuable work that they do for us. Thus, in this "Year of the Operator" it is our desire to set aside a major portion of our conference program to highlight their dedication and professionalism, and to say, thank you for your service.

The 2015 NYC Watershed Science and Technical Conference continues its long history of bringing scientists, engineers and technical experts together with watershed stakeholders and the public to share water quality science.

– William C. Harding

Organizers

The New York Water Environment Association, Inc. (NYWEA) – Founded in 1929, by professionals in the field of water quality as a non-profit, educational organization. Association members helped lead the way toward existing state and national clean water programs. Today the Association has over 2,500 members representing diverse backgrounds and specialties, but all are concerned and involved with protecting and enhancing our precious water resources. *www.nywea.org*

The New York City DEP – DEP is a New York City agency of nearly 6,000 employees that manages and conserves the City's water supply; distributes more than one billion gallons of clean drinking water each day to nine million New Yorkers and collects wastewater through a vast underground network of pipes, regulators, and pumping stations; and treats the 1.3 billion gallons of wastewater that New Yorkers produce each day in a way that protects the quality of New York Harbor. *www.nyc.gov/html/dep*

The Watershed Protection and Partnership Council – Created by the historic New York City Watershed Memorandum of Agreement to provide a regional forum to aid in the longterm protection of New York City's drinking water, and the economic vitality of the Upstate Watershed communities. *www.dos.state.ny.us/watershed/WPPC.htm*

New York State Department of State – The Office of the Secretary of State was established in 1778, making it, other than the Offices of Governor and Lieutenant Governor, the oldest agency in the administration of New York State government. *www.dos.state.ny.us*

Many Thanks to the Conference Sponsors

- Catskill Watershed Corporation
- New York City Department of Environmental Protection
- New York State Department of Environmental Conservation
- New York State Department of Health
- New York State Department of State
- New York Water Environment Association, Inc. Lower Hudson Chapter
- The New York State Environmental Facilities Corporation
- United States Geological Survey
- Watershed Protection and Partnership Council

Photos: Front cover: bottom left, NYCDEP operators, John Madeo, left, and Brian Frear. Back cover: top left, Keneck Skibinski at Town of Orangetown Sewer District. Other photos, bigstock.com

2015 NYC Watershed Science and Technical Conference

"Year of the Operator" Program and Schedule


Michael Garland
NYWEA President


William C. Harding
WPPC Executive Director


Sandra Allen
Deputy Secretary of State


Rob Renner
Executive Director
Water Research Foundation


Timothy P. Burns
NYSEFC

Wednesday, September 9, 2015

8:00 am — Registration *(Location: Washington)*

8:30 am — Welcome, Michael Garland, NYWEA President

8:40 am — Opening Remarks, William C. Harding,
WPPC Executive Director, NYS Department of State

8:50 am — Sandra Allen, Deputy Secretary of State,
Office of Planning and Development, NYS Department of State

9:10 am — Rob Renner, Executive Director, Water Research Foundation

9:40 am — Timothy P. Burns, NYS Environmental Facilities Corp.

10:00 am–10:30 am — Break

MORNING

SESSION I – Weather or Not? *(Location: Bradley North)*

Moderators — Rich Fiedler, GP Jager Inc.; Kara Tedford, ARCADIS

Contact Hours: 1.5 PDH° 1.5 Water

10:30 am — **The Operations Support Tool (OST) with HEFS Forecasts: Recent Use Cases°**

Dr. James Porter, NYCDEP

This presentation will discuss some recent use cases of the Operations Support Tool (OST), a decision-support system that uses new ensemble forecasts of streamflow from the National Weather Service to provide probabilistic guidance for water supply management.

11:00 am — **Extreme Hydrological Event Forecasting and NYC Operations Support Tool°**

Dr. Adao Matonse, NYCDEP

Reported changing patterns in regional extreme hydrological events represent an elevated challenge to operate a complex system, such as NYC water supply. This presentation focuses on extreme events studies over the NYC water supply region and on how the availability of an ensemble forecast as part of the NYC Operations Support Tool (OST) is impacting system operations and helping to reduce risks associated with floods and droughts.

11:30 am — **Performance Assessment of Stochastic Weather Generators for Precipitation over Catskill Mountain Watersheds°**

Dr. Nachiketa Acharya, Alan Frei, Institute for Sustainable Cities, CUNY,
Karen Moore and Jim Mayfield, NYCDEP

To assist in the assessment of potential impacts of climate change on the NYC water supply, NYCDEP is developing a suite of potential 21st century climate scenarios to be used as input to their suite of water supply system models. We are investigating the use of stochastic weather generators as a tool to address this issue. Our goal here is to compare two weather generators with a focus on their ability to simulate extreme events.

12:00 pm–1:30 pm — Lunch, *Washington*

MORNING

SESSION II – Invasion from Planet Phyto *(Location: Hap Arnold)*

Moderators Scott Davis, HDR; Shayla Allen, ARCADIS

Contact Hours: 1.0 PDH° 1.5 Water

10:30 am **Hydrilla, an Invasive Aquatic Plant with Potential to Disrupt Water Supply Activities°**
Meredith Taylor, NYCDEP; Scott Kishbaugh, NYSDEC
In the fall of 2014, an infestation of the invasive aquatic plant *Hydrilla verticillata,* or hydrilla, was discovered in the New Croton Reservoir by a multi-agency group of experts reviewing the plant's extent in the Croton River below the dam. Hydrilla is known to clog intakes, change water chemistry and make waterways impassable. Although eradication efforts are already underway in several parts of the state through cooperative partnerships, the Croton River System infestation poses unique challenges.

11:00 am **Trends of Chlorophyll and Phytoplankton for New York City's West of Hudson Reservoirs (1988–2014)°**
Ray Homolac, NYCDEP
The New York City Department of Environmental Protection (DEP) performs limnology surveys on most of the water supply reservoirs and many water quality monitoring parameters are analyzed. The historical record of DEP data will be examined for long-term trends of chlorophyll a and total phytoplankton in the Catskill/Delaware System reservoirs. An overview for the time period 1988 through 2014 will be presented leading into a more in depth focus for 2004 through 2014.

11:30 am **The Floristic Composition of the Phytoplankton within New Croton Reservoir, New York: Implications for Water Quality Management**
Dr. Michael Principe, HDR
The spatial heterogeneity and temporal variability of phytoplankton floristic composition was studied in Croton Reservoir, NY, initially from 1984–1987, and more intensively during 1988. Findings from the study suggested that when studying phytoplankton dynamics it was not only important to consider reservoir nutrient dynamics, hydraulic residence time effects and light and temperature variations, but it was also essential to examine the individual ecological characteristics of the dominant phytoplankton. Management of the drinking water supply was also discussed.

12:00 pm–1:30 pm Lunch, *Washington*

MORNING

SESSION III – Muddy Waters *(Location: Bradley South)*

Moderators Dale Post, VRI Environmental Services; Allen Shue, ARCADIS

Contact Hours: 1.0 PDH° 1.0 Water‡

10:30 am **Examining Land-Use Changes and Associated Stormwater Management Design in a Sub-Watershed within the NYC Water Supply East of Hudson Watershed – 1997 to Present° ‡**
Mary Galasso, NYCDEP
This presentation examines land-use within a sub-watershed in the New York City Water Supply's East of Hudson watershed over the course of 18 years beginning in 1997. Physical characteristics of the sub-watershed and the nature and density of development, will be addressed along with transitions in stormwater design philosophy, regulatory requirements, and the associated impact on development trends. Stormwater management practices implemented to control water quantity and protect water quality will be discussed.

11:00 am **Implementing Stormwater Green Infrastructure for Regulatory Compliance in the New York City Water Supply Watershed° ‡**
John Drake, NYCDEP
In 2010, DEP updated its water supply efforts by adopting stormwater runoff reduction requirements and green infrastructure design standards into its 1997 Watershed Regulations. This presentation will discuss the overall concept of achieving runoff reduction through green infrastructure, describe current green

infrastructure design, explain how it is implemented, and examine its advantages and limitations in the context of land disturbance activities typically undertaken in the New York City water supply watershed.

11:30 am

Innovative Stormwater Management Applied under Environmental Site Design at a Trash Transfer Station in Baltimore County, MD

Hans de Bruijn, Fresh Creek Technologies

Run-off collects impurities. Obvious methods to capture these solids with flat screens, settling tanks and sand filters work, but how efficient are these methods? Managing the water in run-off goes hand in hand with managing the removed impurities. Innovative designs reduce maintenance cost with infrequent and efficient cleaning methods. Here we show a space saving treatment train reduces pollution by removing, trash, sediment, oil, phosphorus and is remotely monitored to initiate regeneration of the collection surfaces.

12:00 pm–1:30 pm

Lunch, *Washington*

AFTERNOON

SESSION IV – No, Not That Kind of Modeling *(Location: Bradley North)*

Moderators

Laura Csoboth McLean, HDR; Tim O'Connell, ARCADIS

Contact Hours: 2.5 PDH° 2.0 Water‡

1:30 pm

Exploration and Evaluation of Long-Term Water Quality Data° ‡

Karen Moore, Jim Mayfield and Richard Van Dreason, NYCDEP

An important goal in watershed protection is to document changes in water quality and look for linkages to what is occurring on the landscape. We applied statistical methods including Weighted Regressions for Time, Discharge, and Season (WRTDS) to the major inflows of New York City water supply West-of-Hudson reservoirs to look at water quality changes and corresponding explanatory variables related to land management, climatic and hydrological conditions.

2:00 pm

Development of a Watershed Timeline to Chronicle Historical Events for Potential Contribution to Changes in Water Quality° ‡

David Quentin, NYCDEP

There are many natural events that can affect a watershed, and the quality of the water, that may require a change in the operation of a water supply. With this in mind, a New York City Watershed Event Timeline ("Timeline") was developed to ascertain "cause and effect" relationships by linking significant environmental events (e.g., droughts and hurricanes) within the New York City Department of Environmental Protection (DEP) watersheds to water quality variations. Moreover, the effects these events have on DEP operations and infrastructure (e.g., alum treatment, wastewater treatment plant operations, intensified monitoring) can be related for planning purposes. This timeline portrays information from 1985 to the present, and will continue to be a "living document" that can be updated as needed with more information, and new parameter headings that directly relate to other aspects of water supply operation.

2:30 pm

Break

3:00 pm

Recent Advancements in Ground Penetrating Radar Technology Offer Possibilities for Affordable Non-Contact SWE Measurements° ‡

Glenn Horton, NYCDEP

The New York City Bureau of Water Supply has been monitoring snow pack in its 2000+ square mile reservoir watershed for decades manually. These snow surveys are conducted biweekly due to the amount of labor involved, but the regular accumulation-melt cycles common in New York often require more frequent data for maximum usefulness. New York City has begun investigating remote monitoring through non-contact instrumentation to establish Snow-Water Equivalent (SWE) data for winter reservoir management. Recent developments in Ground Penetrating Radar (GPR) technology may provide a cost effective method of measuring SWE.

3:30 pm **Monitoring Turbidity Under Ice Cover at Ashokan Reservoir°**
Allison Dewan, Paul Perri and Brian O'Malley, NYCDEP
DEP deployed an under ice turbidity monitoring system which when deployed during open water conditions, has the capability to provide near real time water quality data throughout the ice cover period. Data collected during this initial deployment will be presented as well as lessons learned during deployment and retrieval.

4:00 pm **Best Management Practices and their Impact on Turbidity in Stony Clove Creek° ‡**
Jim Mayfield, Karen Moore and Danyelle Davis, NYCDEP
Stony Clove Creek has been identified as the predominant source for turbidity and suspended sediment in the Ashokan Reservoir basin. Four best management practices (BMPs) were designed and installed in an effort to reduce the sediment and turbidity. A water quality monitoring program and a channel morphology monitoring program has also been conducted on this reach. The data collected to date by DEP and USGS will be examined to quantify the effects of BMPs.

AFTERNOON

SESSION V – Nerd Alert: Bugs and Chemistry! *(Location: Bradley South)*

Moderators John Sansalone; Claire Superak, ARCADIS

Contact Hours: 2.0 PDH° 0.5 Wastewater* 2.0 Water‡

1:30 pm **Overview of Hillview Reservoir Protozoan Data and Update on Related Research Studies – New York City Water Supply° ‡**
Kerri Alderisio, NYCDEP
As the pre-finished water reservoir for New York City's water supply, Hillview Reservoir is a critical component to the drinking water system. Protozoan sampling was conducted from 2006–2008, and again from 2011 to the present as a result of an administrative order related to covering the reservoir as described in the LT2. An overview of the data will be presented as well as up-to-date results related to any pathogen research associated with Hillview Reservoir.

2:00 pm ***Giardia* Concentrations in New York City's West of Hudson Streams and Reservoirs: Catskill Watershed Case Study° ‡**
Christian Pace and Kerri Alderisio, NYCDEP
Since 2002 the NYC-DEP has taken over 2,800 protozoan samples from West-of-Hudson streams and reservoir outlet sites. This presentation will summarize this data and illustrate *Giardia* reductions as water travels down through the watersheds and from reservoir to reservoir. The presence of seasonal and long-term trends at some locations will be discussed and additional focus will be given to the Schoharie watershed where additional sites have been selected and sampled over the last few years.

2:30 pm Break

3:00 pm **UV-Oxidation for Recalcitrant Chemical Contaminants° ‡**
Scott Bindner, Trojan Technologies
There is increasing attention being payed to chemical contamination in drinking water. Initiatives including the USEPA Unregulated Contaminant Monitoring Rules are driving possible future regulations on chemical contaminants as well as potential demand for advanced water treatment to meet these regulations. This presentation will provide a detailed summary of three drinking water providers who incorporated advanced UV-oxidation treatment for the removal of chemical contaminants including taste and odor causing compounds and 1,4-dioxane.

3:30 pm **Environmental Concerns for Temporary Pumping and Dewatering Applications° ‡**
Ryan Booth and Seth Morris, Godwin Pumps, a Xylem Brand
In most temporary pumping and dewatering applications, there are many risks for the environment ranging from air and noise pollution to erosion concerns and potential damages to endangered species in the area. In many cases the solutions are simple enough to be addressed during the planning and execution phases of these projects with a minimal cost and impact on the total project. Specific examples include spill proofing

for petroleum products, calculating the highest diesel efficiency in a temporary pumping application, automation for diesel pumps to reduce fuel consumption, sound attenuation, using electric pumps (when possible) to reduce emissions, and siphon applications for temporary solutions (when potential energy is available). As always, the ability to identify where to employ these solutions is critical. We intend to show applications where we have successfully employed many of these solution to reduce environmental impact, and show some cost savings for the project and some of the risk/reward criteria that went into making the decision making process.

4:00 pm **Distribution, Density and Movements of Non-breeding Golden Eagles in the Catskills**
Margaret DiBenedetto, Delaware-Otsego Audubon Society
In addition to the annual migration of Eastern Golden Eagles through New York State, some Eastern Golden Eagles over-winter in Delaware and Otsego Counties. Long-term studies are being conducted to determine the population density, distribution and flight habits of this population through camera trapping of eagles at bait stations and live-trapping. Solar powered GPS transmitters are affixed to captured birds and movements are then downloaded and mapped.

AFTERNOON

SESSION VI – Year of the Operator *(Location: Hap Arnold)*

Moderators William Nylic, CDM Smith; Tim Clayton, Holland Company

Contact Hours: 1.5 PDH° 1.0 Wastewater* 0.5 Water‡

1:00 pm–2:30 pm **Wastewater Certification ABC Math Review**
Do You Need Help Passing the ABC Exam? Here's your opportunity! Sit in on this 1.5 hour session to be better prepared for the exam! Repeat Test Takers Welcome!
Robert Wither, PE, NYS Department of Environmental Conservation
Are you having trouble with the formulas on your ABC test? Don't miss this opportunity to review for the ABC Exam used to obtain NYS Operator Certification. Participants will review formulas, be shown examples, work through problems and example calculations with the assistance of the NYSDEC staff, and learn how to apply the appropriate formulas where necessary. This review is good for all Grade levels.

2:30 pm Break

3:00 pm **Denitrifying Bioreactors Reduction of Agricultural Nitrogen Pollution at the Watershed Scale° * ‡**
Chelsea Morris, Will Pluer and Larry Geohring, Cornell University
Denitrifying bioreactors (DNBRs) have the potential to reduce nitrogen (N) loading to streams in agricultural watersheds. By passing the nitrate-rich waters of tile-drained fields through a system engineered for denitrification, the total loading of N is reduced before entering sensitive aquatic ecosystems. N removal rates from the experimental data are applied in a scenario analysis of a New York State watershed with multiple DNBRs to project aggregate N reduction potential.

3:30 pm **A Transition to Resource Recovery Facility through the installation of Enhanced Primary Treatment°**
Alex Wright, ClearCove
A facility in upstate New York is installing the ClearCove Harvester and Classifier technologies. This presentation will cover an overview of the Harvester and Classifier technologies, the full-scale design of the system, and the plant wide implications of its installation. Pilot data from a NYSERDA-funded demonstration project in Ithaca. NY will be presented to communicate the performance of the technology in terms of removal capabilities and its impacts on the energy balance of the facility.

4:00 pm **Intended and Unintended Consequences of Collection System Rehabilitation: One Experience° ***
James Fitzsimmons, Matthew Burd, NYCDEP
Unintended consequences are a challenge to planners in wastewater operations as elsewhere. This presentation is a report of true events, rather than a report of a controlled experiment. The narrative will update progress of an infrastructure rehabilitation project, first reported by poster at the 2014 Water Environment Technical Exhibition and Conference. The project, nearing completion in spring of 2015, can still be seen to include both intended flow reductions and unintended consequence of warming effluent.

NYWEA Awards Program

Please help us to recognize deserving members. NYWEA has eleven award categories and over 30 awards that honor exceptional members and/or their utilities.

(L-r:) Nat Federici, NYWEA President, Steve Fangmann, Amanda Bauner, James Pynn and Robert Ivers received the Kenneth Allen Memorial Award for their paper entitled "Newtown Creek Wastewater Treatment Plant: Central Residuals Building Project – Total Project Management Gone Right"

For more information, go to the NYWEA website at nywea.org.

Looking for Volunteers!

The NY Water Environment Association is a volunteer driven organization with programs that contribute to the efficient operation of the organization. We invite you to consider getting involved in one of the following committees:

- Asset Management
- Awards Committee
- Conference Management
- Energy/Research Committee
- Environmental Science Committee
- Government Affairs Committee
- Hall of Fame
- Humanitarian Assistance Committee
- Member Education Committee
- Membership Committee
- Pretreatment Committee/ Industrial Wastewater
- Program Committee
- Public Outreach
- Publications Committee
- Residuals & Biosolids Committee
- Scholarship Committee
- Strategic Planning
- Student/University Committee
- Sustainability
- Utility Executive Committee
- Wastewater Collection System Committee
- Wastewater Facilities Committee
- Watershed Committee
- Young Professionals

For more information contact Patricia Cerro-Reehil at pcr@nywea.org

Exhibitors

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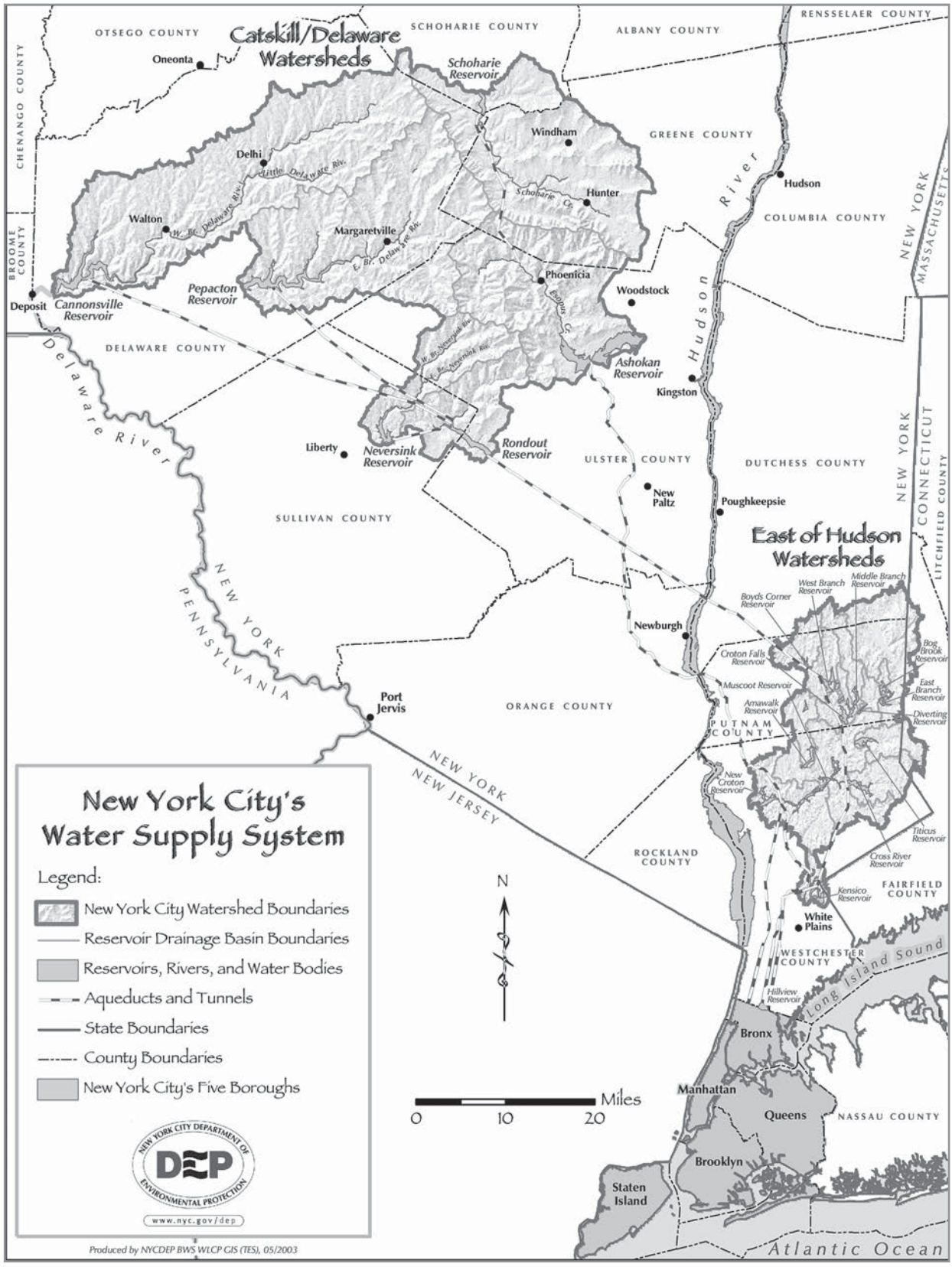
New York City's Water Supply System Map



"Watershed – An area of land, a bounded hydrologic system; within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

– John Wesley Powell

Notes

Upcoming NYWEA Meetings/Training

Fundamentals of Wastewater Asset Management
September 15, 2015, Watertown, NY
October 28, 2015, Monticello, NY
December 3, 2015, Rexford, NY

Anaerobic Digestion
October 22, 2015, Babylon, NY
November 5, 2015, Binghamton, NY
November 12, 2015, Lockport, NY

Class A & B Biosolids Drying Technologies
November 6, 2015, Macedon, NY

Green Infrastructure Maintenance Training Program
November 19, 2015, Babylon, NY

Confined Space
January 13, 2016, Williamsville, NY
February 26, 2016, Bath, NY
March 31, 2016, Babylon, NY

NYWEA 88th Annual Meeting and Exhibition
February 8–10, 2016
NYC Marriott Marquis

Activated Sludge
March 9, 2016, Syracuse, NY
March 17, 2016, Rexford, NY

CES Safety Training
April 6, 2016, Middletown, NY

SPDES Regulatory
April 14, 2016, Rexford, NY
June 15, 2016,
Hopewell Junction, NY
July 22, 2016, Rochester, NY
November 3, 2016, Binghamton, NY
November 18, 2016, Lockport, NY

Clean Methane
May 19, 2016, Rexford, NY
September 13, 2016, Watertown, NY
October 24, 2016, Monticello, NY
November 4, 2016, Macedon, NY
November 17, 2016, Babylon, NY

Nitrogen Removal
July 15, 2016, Dunkirk, NY
October 20, 2016, Babylon, NY

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