

Watershed Agricultural Council: Conserving Water Quality and the Rural Working Landscape

by Tom O'Brien and Tara Collins

To follow the trail of clean drinking water to New York City (NYC) faucets, one's journey starts in the far corners of Delaware County, on the northwestern side of the Catskill Mountains, and the headwaters of the Delaware River. The Delaware Watershed is adjacent to the more southeasterly Catskill Watershed, the latter which is fed by several smaller rivers, creeks and kills (or streams), both current and historical (submerged). Together they comprise the Catskill-Delaware System (Cat-Del), the largest catchment for the New York City drinking water supply system. The Cat-Del system holds six reservoirs west of the Hudson River and one east of the river. (There are a total of 12 additional reservoirs and three controlled lakes on the east side of the lower Hudson River in the Croton Watershed, an area not covered in this article.)



Photo by Drew Hartry/ranau.DrewHartry.com

In the Catskill-Delaware Watersheds, Whole Farm Plans, Forest Management Plans and Conservation Easements come together upstream in the counties of Delaware, Greene, Schoharie, Sullivan and Ulster, to protect drinking water in unique ways that benefit New York City residents.

Protecting the Water Trail to NYC

Roughly three hours beyond the City limits lies the Cat-Del water supply system, one of the world's largest surface drinking water storage and supply systems, and the largest unfiltered. This system holds approximately 580 billion gallons of water, covers approximately 1,600 square miles and provides 90 percent of the upper limit of 1.4 billion gallons per day¹ needed by metropolitan New York City. This "trail" of clean drinking water didn't just happen; it required vision and significant investment of political, financial, technological and human capital by the City of New York, matched by the life altering compromises and participation (sometimes unwilling or at best reluctant) of the inhabitants of this water-rich region. The historical aspects of this water supply system are legendary and an important part of the story, but not our focus here.

Today the story is one of watershed protection, through an innovative, collaborative effort among the Watershed Agricultural Council (WAC), the New York City Department of Environmental Protection (DEP), state and federal watershed and water supply regulators, local agencies, watershed farmers and forest landowners and other agricultural and forestry businesses. With funding coming principally



Photo by Drew Hartry/ranau.DrewHartry.com

Horse farm and stable owners comprise the majority of landowners in the Croton watershed.

from the DEP, secondarily from the US Department of Agriculture (Forest Service, Natural Resources Conservation Service and Farm Service Agency), the WAC works in partnership with other nonprofits and local agencies to assist watershed residents in conducting land-based activities and business enterprises that will, with the application of best conservation practices, be protective of water quality, without negatively impacting their business bottom line (- piece of cake!).

One of the drivers in the NYC Cat-Del Watershed is the issuance/reissuance (2007-2017) of a Filtration Avoidance Determination (FAD) to the City by the federal and state regulators (NYS Department of Health, US Environmental Protection Agency, and NYS Department of Environmental Conservation). In complying with the terms of the FAD on an ongoing basis, the City has been able to avoid building a multi-billion dollar filtration system. Reissuance of the FAD in 2007 is proof positive for WAC that the water quality programs that it implements on behalf of the City work and need to continue working.

"Best" conservation practices or Best Management Practices (BMPs) are one of the tools in the WAC toolbox and are applied as a result of environmental assessments (of various forms) and pursuant to the development of conservation plans (Forest Management Plans and Whole Farm Plans). The implementation of conservation plans has resulted in a greater level of protection for the NYC water supply and is the foundation of this watershed protection program's success.



Photo by Drew Hartly/www.DrewHartly.com

The J.J. Farber Farm was one of 10 pilot farms in 1992 that paved the way for permanent nonpoint source pollution prevention in the New York City water supply system. Those 10 farms served as stepping stones to the formation of the Watershed Agricultural Council in 1993.

However, the implementation of stormwater BMPs is not the whole watershed protection story and in itself is more challenging to accomplish than it may appear.

Understanding better how and why the programs and tools that WAC utilizes work can be traced back to the basic purposes and tenets upon which WAC was founded. The Council was incorporated in 1993, two years after the inception of the Watershed Agricultural Program and four years before the signing of the historic NYC 1997 Watershed Memorandum of Agreement (MOA). The WAC was the brainchild of many people but considerable credit has to be given to a succession of DEP commissioners and NYC watershed farmers and farm agencies. The Council was founded to assist DEP with meeting its goals of providing safe drinking water to NYC and to do so working with farmers and other agricultural businesses (later forestry interests), so that water supply protection did not unnecessarily impinge upon the profitability of region's farm industries. True to its original inception, this nonprofit Council is today comprised of watershed farmers, forest landowners and forestry and agri-business owners. The tenets upon WAC was founded hold true as well: that the program be voluntary; that it be based on sound science; that it be locally controlled; and that it be fully funded.

Following the core Agricultural Program, and concurrent with the signing of the 1997 MOA, WAC and DEP have implemented a Forestry Program, in conjunction with the US Forest Service, and a Farm Conservation Easement Program. Throughout its 16-year tenure, WAC has also worked on the economic development side, providing farms and forestry businesses with technical assistance, pass-through matching grants, branding campaigns and production and marketing workshops to enhance their respective ability to be profitable and sustainable. The devil is always in the details, however, and the success of these individual programs is sometimes hard won. Described below to a greater extent is how they work.

Watershed Agricultural Program: The Watershed Agricultural Program staff work with individual farmers on a voluntary basis to develop and implement Whole Farm Plans. These conservation plans are individually designed to mitigate water pollution risks on or from their farm. The implementation of these plans consists of conservation practices (or BMPs) ranging from structural systems that divert or treat runoff to farm system operations (such as short-term manure storage) and management techniques that assure the long-term



Photo by Drew Hartly/www.DrewHartly.com

Open working landscapes like pastures and forests blend the objectives of water quality and stable, local economies like this dairy farm in Green County.

success of these practices (such as manure spreading plans). The program utilizes the professional expertise of engineers, agronomists, farm and nutrient management planners, geo-spatial data experts and stream management experts, along with a host of general contractors who move earth, lay water lines, construct wood and steel structures, pour concrete and plant trees, to name some of who they are and what they do. The player who likely gets the least credit in all of this is the farmer, the one who may have his/her business operation disrupted for weeks or months at a time and who usually has to significantly adapt or modify farm management systems to ensure that the installed practices are operated and maintained (at the farmer's expense) so that those BMPs continue to work as intended. Collectively, all of these people work to create and implement conservation plans to protect the water and the land and that are compatible with the landowners' goals and objectives.

Today, approximately 300 large farms (>\$10,000 annual gross income) have participated in the program and 50-plus smaller (\$1000-\$10,000 gross annual income) throughout the watershed, in addition to some 100-plus other types of agricultural enterprises. Ninety-two percent of the original watershed farms (circa 1991) are presently enrolled in the Agricultural Program covering upwards of 100,000 NYC watershed acres.

Watershed Forestry Program:

The Watershed Forestry Program works with forest landowners, consulting foresters and loggers on a voluntary basis to develop and implement conservation plans known as Forest Management Plans. These plans provide landowners with an educational and management tool that allows them to steward their forest resources for their many important values (water quality, lumber, firewood, aesthetics, habitat, open space, recreation, etc.). The program staff connect forest landowners with consulting foresters and



Photo by Drew Hartly/www.DrewHartly.com

Stewardship of the rich forest resources is vital to the Watershed.

continued on page 28

continued from page 27

loggers who have been provided with specialized watershed training (i.e., Trained Logger Certified – TLC) to assist them in managing their forestland. Through a partnership with the US Forest Service (USFS), the WAC and the DEP, the program offers funding, technical expertise and services to forest landowners and loggers. These grants, cost-share resources and equipment loans and rentals facilitate a range of stewardship activities, such as professional forest management planning, tree planting, stream bank enhancement (riparian area delineation and management), forest road construction and/or remediation, control of invasive species, and timber stand improvement.

The Forestry Program also oversees three model forest sites which serve as living classrooms on topics such as erosion control



Photos by Dreaa Harby www.DreaaHarby.com

Richard Giles, owner/operator of Lucky Dog Organic Farm in Hamden, Delaware County, seen here harvesting his lettuce crop, holds a Whole Farm Plan and Conservation Easement on his land. He believes in clean water and healthy soils and has taken that commitment seriously by joining the WAC Board of Directors in 2009.

techniques and sustainable timber harvesting, as well for research on topics such as carbon sequestration and management of invasive species. Model forests include Lennox Memorial Forest with Cornell Cooperative Extension of Delaware County in Delhi; Siuslaw Model Forest with Cornell Cooperative Extension of Greene County in Acra; and the Model Forest at Frost Valley YMCA in Ulster County. Funded by the USFS and DEP, this program also develops and supports local economic development strategies to encourage the retention and growth of the forest products industry in the watershed region.

Conservation Easement Program: The Conservation Easement Program works to conserve farm land, with associated forest land or woods, by purchasing the development rights and other interests in these properties. Permanent protection of these “undeveloped” lands through conservation easements is ultimately the most lasting water quality protection strategy. Landowners with approved Whole Farm Plans are eligible to apply for participation in the Easement Program on land that they own. As an aside, many farmers depend on using additional land that they lease – rented land is a major component of many watershed farm enterprises. That fact poses other challenges in conserving enough farmland in the watershed to maintain a viable agricultural industry.

The benefits of purchasing farm conservation easements are many. For example, farm land is preserved in perpetuity and forest contiguity is maintained. The proceeds from the sale of a conservation easement can increase landowners’ options to continue, expand or exit farming. Conservation easements may provide more opportunity to transfer the farm or forestry enterprise to the next generation or another farmer. Easements prevent land-use conversion to commercial, industrial or residential development, all of which are counter to source water protection. To date, the WAC has purchased 82 conservation easements protecting 16,529 acres of agricultural and forest land in the NYC watershed. The Council holds two additional, donated easements outside the watershed totaling 1,043 acres. In 2009, the program plans to sign an additional 13 contracts on over 2,500 acres of additional farm and forest land.



Economic Initiatives: The Economic Initiatives of the WAC provide services that are directly related to business profitability and overall economic development in the watershed region. These challenges transcend watershed boundaries so WAC works in entire watershed counties and, in some cases, adjacent “gateway” counties. The Farm-to-Market Program works with farmers and other food producers by assisting them in developing new market-based skills. The “Pure Catskills” regional branding and “buy local” campaign stimulate the local economy by uniting farmers and their products with local and regional consumers (see logo above). The WAC partners with various community-based and regional agencies to identify and take action on these projects.

Forestry has its “buy local” equivalent, Catskill WoodNet, an initiative that networks regional wood products and manufacturers and enhances their market exposure, consumer access and sales.

continued on page 31

Aqua-Aerobic®

PARTNERING WITH YOU ::

:: INNOVATION

:: SERVICE

:: TRAINING

:: For Total System Solutions ::

Our experience in Aeration and Mixing coupled with years of expertise in Biological Processes and Filtration Systems allows us to provide you with the most advanced treatment solutions at the lowest life cycle cost. Aqua-Aerobic Systems' advanced wastewater technologies meet or exceed the most stringent effluent requirements and are designed to easily accommodate changing effluent demands. **Let Aqua-Aerobic Systems partner with you for the best treatment solution.**

:: AERATION & MIXING



- Range of models, sizes and options
- Proven high efficiency and reliable performance
- Low maintenance and easily retrievable from basin
- Endura® Series no-maintenance motors

:: BIOLOGICAL PROCESSES



Batch Processes

- Time-managed nutrient control
- Maintenance-free decanter
- Enhanced process control with IntelliPro® monitoring system
- Lowest life-cycle cost

Flow-Through Systems

- Up to 50% power savings with staged aeration systems
- Unique phase separator reduces WAS volume 20-50%

:: FILTRATION



- OptiFiber® family of cloth media designed for specific applications
- Diamond, and disk configurations available
- Smaller footprint
- Automatic, PLC based control system
- Lowest life-cycle cost

:: MEMBRANE SYSTEMS



- Time-managed, sequential aeration
- Equalization, nitrogen and phosphorus removal within a single reactor
- Removal of cryptosporidium and giardia
- Enhanced process control with IntelliPro® monitoring system

:: CUSTOMER SERVICE



- Replacement diffusers
- Aftermarket products and services
- Extended warranties
- PLC controls upgrades
- Rental/Lease options

FOR MORE

INFORMATION

CONTACT:

Aftek, Inc.

740 Driving Park Avenue
Rochester, NY 14613

Phone: 585.458.7550 Fax: 585.458.7476

G.P. Jager & Associates, Inc.

10 Bradley Lane
Montvale, NJ 07645

Phone: 201.986.1994 Fax: 201.986.1945



AQUA-AEROBIC SYSTEMS, INC. • 6306 N. Alpine Road • Rockford, IL 61111 • PH 815.654.2501 • FX 815.654.2508 • www.aqua-aerobic.com



CONESTOGA-ROVERS & ASSOCIATES

Buffalo
Niagara Falls
Rochester

From our founding in 1976 with one Western New York client, to today with more than 90 offices and 2,900 employees serving the public and private sectors worldwide, client focus supported by technical excellence and teamwork remains our guiding philosophy. For more information please contact us at **800-724-4414** or **www.CRAworld.com**.

Facility Design

Process Design

Advanced Technologies

Collection System Design

Regulatory Compliance

Residuals Management

Energy Profile Optimization

Operations Management Support



Engineering

Environmental

Construction

IT Services



Reduce Power Use With Energy-Saving Valve Technology

Want your pumps to consume less power, especially during the hours of peak-load pricing for electricity? Let Harper International help you calculate the costs you'll cut by adding energy-saving ball valves to your pump stations.



HARPER INTERNATIONAL

Solving problems in fluid systems since 1974

www.SolutionsByHarper.com

VALMATIC®

Call Fred Haines or Tom Kuehnelt
at 203-323-2600 or 800-551-2733



Small farms with gross incomes under \$10,000 are among the fastest growing farm segments, both in New York State and nationwide.

Photo by Drew Hartly/
www.DrewHartly.com

Adding the *Pure Catskills* brand to this network helps to further promote local wood producers and their products, strengthening the regional economy by connecting local wood manufacturers and artisans with ready buyers and markets.

Other Safeguards to Water Trail

To mention in brief, the WAC also has dedicated staff working in the Croton Watershed on farm and forest conservation planning and BMP implementation, as well as in providing services to local land trusts and counties for stewardship of conservation easements. Currently, over 100 farm and forest landowners participate in the Croton Program.

Outreach through educational workshops, seminars, grassroots



Cannonsville Dam aerial view

Courtesy of NYCDEP

festivals and farm/forest tours enable the WAC to reach out to its program participants and the general public. Both the Agricultural and Forestry Programs share their knowledge and accomplishments through editorial board visits, bus tours for visitors, academia, reporters and decision makers, traveling information kiosks at local fairs, and semi-permanent kiosks at strategic locations throughout the watershed region. For example, the Watershed Forestry Institute for Teachers runs a tandem Green Connections, an environmental education program targeting middle school students from the Catskills and New York City. The WAC staff also serve on outside boards and committees related to their respective expertise.

The “trail” of New York City’s clean drinking water runs through



Photo by Drew Hartly/
www.DrewHartly.com

This family is enjoying a trail on Maple Shade Farm in Delhi, NY. It caters to educating families about agriculture, clean water and conservation, offering nature trails and educational seasonal events such as pressing apple cider and gathering maple syrup.

the farms and the forestland of the Watershed Agricultural Council’s program participants on its way from the Catskills to the consumers. Along the way, the WAC works with landowners and others to protect this precious natural resource and to help provide NYC with high-quality drinking water through the foreseeable future. The conservation practices, economic development projects and acquired conservation easements serve to maintain the local rural economy and to safeguard the drinking water for metropolitan NYC. The Watershed Agricultural Council is on this trail together, in partnership, with the DEP, federal, state and local partners, and the landowners from whose land this water resource flows.

Co-authors Tom O’Brien and Tara Collins are solely responsible for the content and any errors in this article. Tom O’Brien is Executive Director of the Watershed Agricultural Council. Tara Collins is the Council’s communications director, and can be reached at taracollins@nycwatershed.org or 607-865-6090, ext. 225.

Citation

1. 2006 water usage – 1068.7 mgd, 133.5 g/d per capita; 1991 water usage – 1496.3 mgd, 204.1 g/d per capita, NYCDEP website; Copyright 2009 The City of New York; last updated January 22, 2007; http://nyc.gov/html/dep/html/drinking_water/droughthist/shtm.