TOMPKINS COUNTY
WATER QUALITY STRATEGY

2016-2018

Tompkins County Water Resources Council
Adopted: October 19, 2015

Water Resources Council Members

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Business and Industry	Sarah Dwyer, Center for Nutrition Studies
Cornell Cooperative Extension	Sharon Anderson
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Tompkins County Water Resources Council
Water Quality Strategy

2016 - 2018

TABLE OF CONTENTS

I. INTRODUCTION AND BACKGROUND

The preservation and improvement of the waters of Tompkins County are of increasing and vital importance to the health, welfare, and economic well-being of the present and future inhabitants of the County. The water resources of the County -- both surface water and groundwater -- are:

- a source of drinking water,
- an economic resource for tourism and recreation,
- a necessary component for supporting agriculture, water-based businesses, and other businesses,
- crucial for the flora and fauna of the region, and
- a part of the system for treating human, industrial, and agricultural waste.

These water resources are integral parts of the environmental fabric and add to the quality of life for residents and visitors alike.

The land area of Tompkins County is in three watersheds: Cayuga Lake and Owasco Inlet, both of which flow north into the Oswego River basin and then into Lake Ontario, and the Susquehanna River basin, which flows south into the Chesapeake Bay. Over 350 square miles (223,792 acres) of Tompkins County are in the Cayuga Lake basin, 34 square miles (21,753 acres) are in the Owasco Inlet basin, and over 96 square miles (61,459 acres) are in the Susquehanna River basin.

New York State (NYS) has agreements with the United States Environmental Protection Agency (EPA) to implement the various provisions of the federal Clean Water Act and the Safe Drinking Water Act. As part of this effort, and in conjunction with the NYS Soil and Water Conservation Committee, the NYS Department of Environmental Conservation (DEC) encouraged the creation of county-level Water Quality Coordinating Committees.

In 1992, the Tompkins County Board of Representatives appointed a Water Quality Steering Committee consisting of persons with technical backgrounds in water resources issues. Their initial task was to draft a Water Quality Strategy Plan. The Board of Representatives adopted this first plan on June 16, 1992.[1] This initial concept has evolved to now include planning for comprehensive water-resources management. That document is now known as the Tompkins County Water Quality Strategy (WQS). The WQS helps define local pollution and degradation concerns and and informs local governments and agencies as they work to correct current and prevent potential problems.

Water Quality Strategy (WQS)

This WQS serves to guide policy and activities related to water issues in the County. The purpose of the WQS is to analyze the status of water resources, prioritize issues and concerns, and lay out how to address the prioritized water-quality issues and concerns throughout Tompkins County. The WQS does this by setting goals and defining objectives. The WQS also seeks to reduce conflicts and/or redundancy and to promote the sharing of information and resources among agencies, organizations, and public-interest groups with significant water-related programs.

In order to protect and enhance the quality of the local water resources, it is important for Tompkins County to work in a coordinated manner with local, regional, state, and national government agencies and entities, and with other organizations, groups, and individuals. In order to direct the work of Tompkins County and to assist in establishing partnerships for the protection and improvement of water resources, it is important to have an

[1] Resolution No. 192 of 1992.

established strategy that should be used to guide the allocation of financial resources and determine future work related to water resources in the County.

The Water Resources Council of Tompkins County (WRC) is responsible for revising and updating the WQS with input from the public and interested agencies. An update of the WQS should be accomplished at least every three years.

Tompkins County Water Resources Council (WRC). The Tompkins County Board of Representatives created the WRC and related Technical Committee in 1997[2] to advise the County Board of Representatives on matters affecting the preservation, enhancement, and use of water resources in the County. In 2000 the WRC was restructured by the Board of Representatives[3] to merge technical and policy memberships and provide for participation by any person with expertise and/or interest in the County's water resources.

The WRC also serves as the County's Water Quality Coordinating Committee, while maintaining its role as an advisory committee to the Tompkins County Legislature.[4] In addition, the WRC strives to stay informed about, and comment on, topical issues with a strong relationship to water quality and/or quantity. It participates in opportunities to comment on related projects and issues, for example, dredging, gas drilling operations, and municipal water treatment options. It is also alert to emerging contaminants and responds as deemed appropriate.

Another important function of the council is to provide a venue for water organizations to communicate with each other and the public, and to collaborate with other organizations and agencies on activities that further WQS goals.

II. WATER RESOURCES

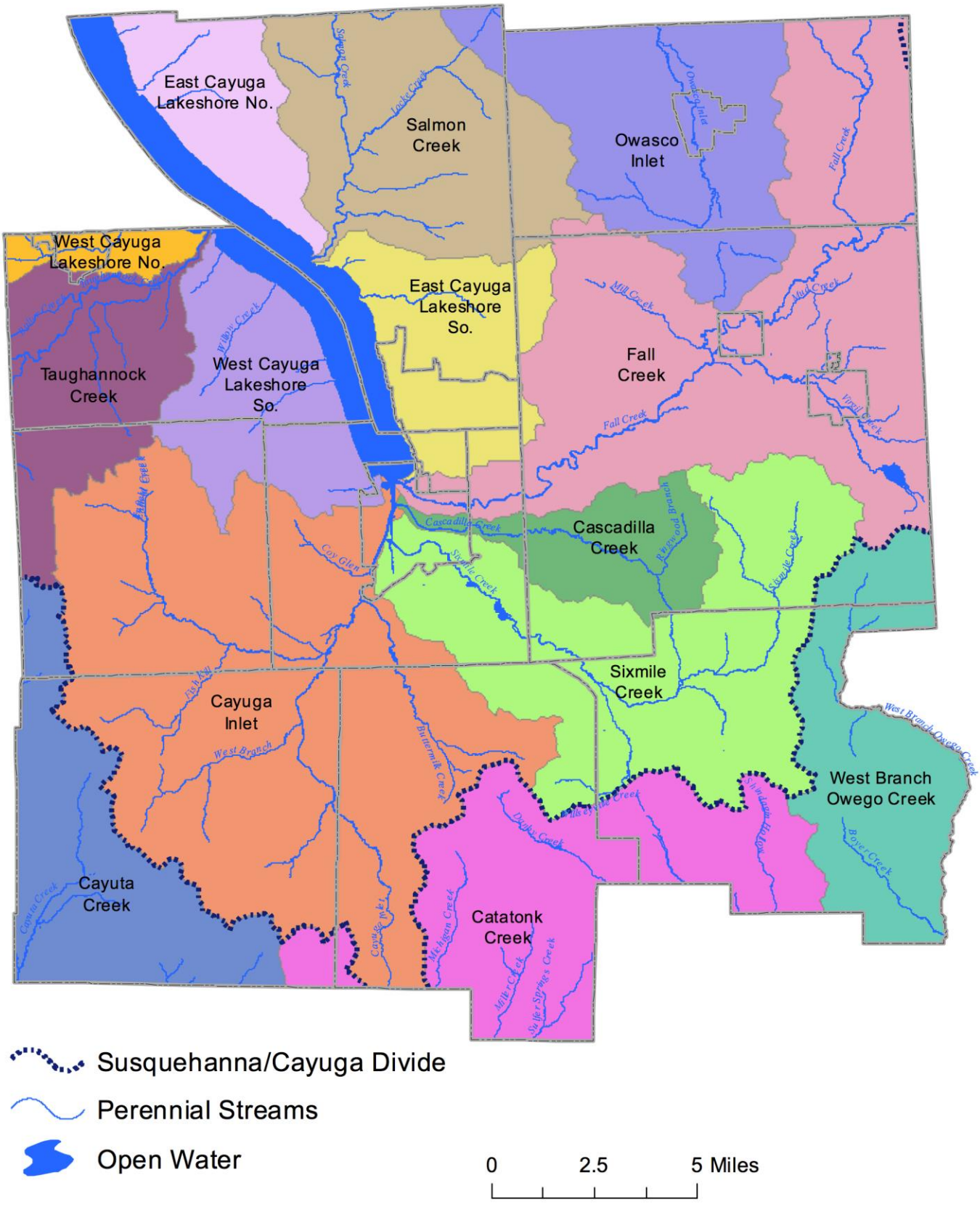
For the purposes of this document, it is useful to distinguish between surface water, for which there is a substantial body of information, and groundwater, about which much less is known. However, it is important to note that surface water and groundwater interact, making them part of the same system and, ultimately, one resource. Wetlands and riparian corridors are transition zones between aquatic and terrestrial environments and also play a critical role in maintaining water quality.
Surface water and groundwater are extensively used for:

- Drinking water for individual wells and municipal and other large systems,
- Agriculture,
- Recreation,
- Water-based businesses,
- Wastewater disposal,
- Cooling and heating,
- Plant and animal habitat,
- Stormwater transport, and
- Flood control.

Maps of Tompkins County watersheds, surficial aquifers, and wetlands are provided in this document. A map of municipal and abandoned landfill sites in Tompkins County, as well as the aforementioned maps, is available at the Tompkins County Planning Department.

[2] Resolution No. 181 of 1997.
[3] Resolutions No. 57 of 2000 and No. 211 of 2000.
[4] The Tompkins County Board of Representatives, prior to April 2003.

Watersheds


East Cayuga Lakeshore No.
Salmon Creek
Owasco Inlet
West Cayuga Lakeshore No.
East Cayuga Lakeshore So.
Taughannock Creek
West Cayuga Lakeshore So.
Fall Creek
Cascadilla Creek
Sixmile Creek
Cayuga Inlet
West Branch Owego Creek
Cayuta Creek
Catatonk Creek
Susquehanna/Cayuga Divide
Perennial Streams
Open Water
0
2.5
5 Miles

Importance of Surface Water

Surface water is the drinking water source for over half of Tompkins County residents. There are three water treatment facilities in Tompkins County using surface water as their source:

- Bolton Point, which is run by the Southern Cayuga Lake Intermunicipal Water Commission using Cayuga Lake as its water source;
- Cornell University Water Filtration Plant using Fall Creek; and
- City of Ithaca Water Treatment Plant using Sixmile Creek.

In addition, several drinking-water systems rely on groundwater (springs, wells, or infiltration galleries) that are considered "groundwater under the direct influence of surface water" (GUDI). This means that the microscopic quality of this water is similar to that of surface water and in order to make it safe for drinking it must be treated like surface water to remove any harmful organisms. True groundwater may only need disinfection to meet water quality regulations, but surface water (and GUDI sources) must also be filtered to achieve the required standard for clarity and the reduction of microorganism.

Surface water is vulnerable to a host of point and non-point pollution sources. There is almost no activity in the county that does not in some manner have the potential to impact our surface water resources. Some of these are fuel and other chemical spills, failing on-site wastewater treatment systems, proper and improper application of fertilizer and pesticides (both agricultural and residential), improper manure-spreading practices, pet waste, treated wastewater discharges, erosion from construction sites, runoff from concentrated livestock operations, erosion from agricultural practices, invasive species (both aquatic and terrestrial), improper road bank and ditch maintenance, road and airplane deicing materials, untreated or poorly treated urban storm-water runoff, illegal dumping (via public access to streams), riparian development, runoff from parking lots and other impervious surfaces, and air pollution (e.g., open burning can produce dioxins that travel in air, attach to particles, and reach surface water via rain). Actions to minimize these problems include:

- maintain natural wetlands with their beneficial services for purifying water,
- utilize best management practices for nutrient management,
- implement best management practices to reduce both agricultural and urban runoff and erosion,
- prevent the introduction and spread of aquatic and terrestrial invasive species,
- reduce pesticide use by practicing integrated pest management (IPM),
- properly site and maintain on-site wastewater treatment systems,
- re-vegetate road ditches and banks (e.g., hydro-seeding),
- protect and restore riparian corridors, including wetlands, and
- reduce nutrient discharges from wastewater treatment plants.

Regulations intended to protect surface waters can be and are enacted at every governmental level. The federal government has passed the Water Pollution Control Act (Clean Water Act) and the Safe Drinking Water Act and both are enforced by the Environmental Protection Agency. New York State has Public Health Law and Environmental Conservation Law enforced, respectively, by the Health Department and the Department of Environmental Conservation. These laws and regulations affect the taking and use of water from, and the discharges back to, the environment. Tompkins County has its Sanitary Code that provides protection from on-site sewage systems and other discharges and regulates drinking-water systems. In addition, under NYS Public Health law, public water purveyors can enact Watershed Rules and Regulations (WRR to protect their sources of water (only the City of Ithaca and Cornell University did so, decades ago) – but enforcement of these regulations is nearly nonexistent. Recently (2008), however, the City of Auburn and Town of Owasco in Cayuga County have begun enforcing the Owasco Lake WRR, which affects the Village of Groton, a large part of the Town of Groton, and smaller parts of the Towns of Lansing and Dryden.

Invasive Species. In 2014, New York State passed new state regulations targeting aquatic invasive species. Boaters in New York State are now required to clean and drain boats both prior to launching from and when exiting boat launches, including Cayuga Lake. These regulations are part of an aggressive effort to prevent invasive species from entering and damaging New York water-bodies. The harmful impacts that aquatic and terrestrial invasive species have on water quality can be profound. Invasive species can degrade water quality in a numerous ways, including:

- Outcompeting beneficial native species;
- Creating excessive growth in water-bodies which leads to decreased light penetration, reduced flow, increased nutrient load and biomass decomposition, and decreased dissolved oxygen;
- Increased erosion through outcompeting or killing native vegetation that helps to secure stream banks and soil; and
- Providing conditions conducive to the growth of harmful blue-green algae.

Stormwater. Stormwater has a strong influence on surface water quality. When it rains, water flows over forests, fields, driveways, lawns, roads, parking lots, and farms throughout the watershed as it travels to streams, lakes, and ponds. Along the way, stormwater picks up soil, chemicals, and other pollutants. Polluted stormwater degrades our lakes, rivers, wetlands, and other waterways. Nutrients such as phosphorus can cause the overgrowth of algae. Toxic substances from motor vehicles and application of pesticides and fertilizers threaten water quality and can kill fish and other aquatic life. Bacteria from animal wastes and improper connections to storm sewer systems can make lakes and waterways unsafe for wading, swimming, and fish consumption. Eroded soil in the form of sediment is a pollutant as well, and can cloud the waterway and interfere with the habitat of fish and plant life.

Since 2010, developments that disturb more than one acre of land must design practices (Green Infrastructure) to control stormwater quality by filtration and reduce runoff quantity by providing for infiltration of a portion or all of the increased volume of stormwater due to the increased impervious area. [5]

Importance of Groundwater

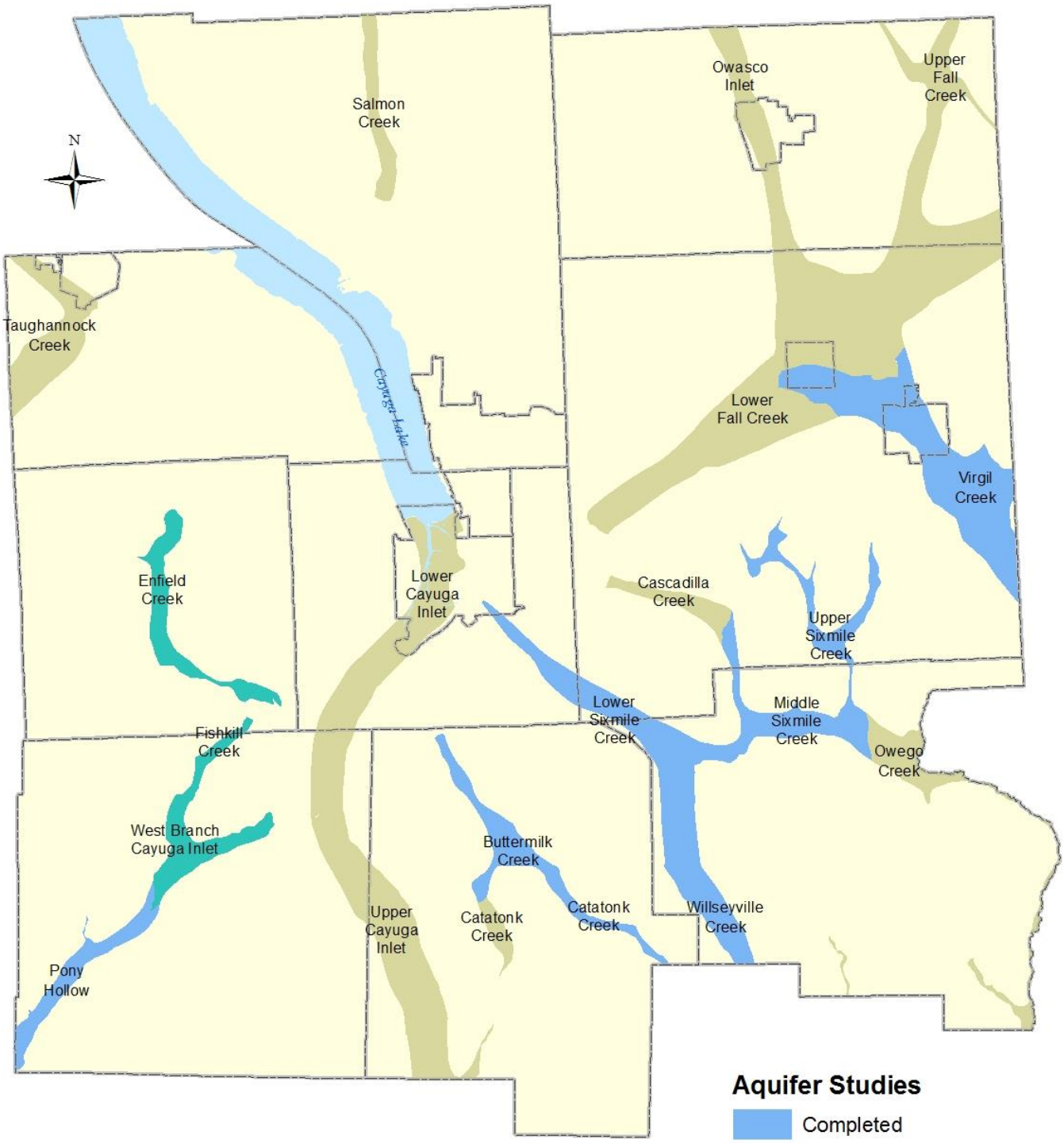
Groundwater resources are an important source of water for residential, commercial, and industrial uses. In Tompkins County, groundwater is a primary source of drinking water for about 43% of the residents of Tompkins County. The Tompkins County Department of Health maintains a list of public groundwater systems in the county. The list includes restaurants, mobile home parks, schools, campgrounds, apartment buildings, and municipal water systems. In addition, thousands of rural residents receive their drinking water from individual private wells.

In many areas, the groundwater interacts with surface-water. Therefore the water in these areas should be considered a single system. At these interfaces, each system can contaminate the other, requiring careful and prudent protection of both. Contaminated aquifers that discharge to streams can result in long-term contamination of surface water; conversely, streams can be a major source of contamination to aquifers. Groundwater typically contributes more than half of the total annual flow to local streams and creeks.

Aquifers. Unconfined aquifers are replenished (recharged) by infiltration of precipitation from the ground above and, in some areas, by seepage loss of surface water to the aquifers below. Impervious surfaces (such as paved roads and parking lots, roofs, buildings.) increase runoff. These impervious surfaces threaten to reduce the amount of recharge to aquifers by inhibiting the percolation of precipitation. Confined aquifers are partially protected by an impermeable soil layer that prevents water from entering the aquifer directly from the ground surface. These aquifers are recharged from areas (sometimes miles away) called aquifer recharge areas where the impermeable layer doesn't exist.

[5] Although FEMA provides access to flood insurance based on Federal flood maps, the maps for Tompkins County are significantly out of date. The provision up-to-date maps would provide municipal officials, developers, residents, and others with much needed information.

Tompkins County
Confined Aquifer Studies



Source: Unconsolidated Aquifer Study, T.S. Miller, 1999

Created August 2015

Tompkins County Planning Department

Unlike surface water, which flushes contaminants downstream relatively quickly, groundwater in aquifers moves relatively slowly and can take from a couple of years to more than decades to move from the point of origin to the point of discharge. Once contaminated, an aquifer can become unusable, and often remediation is not technologically or economically feasible, especially for small or rural communities.

Because of the paucity of information about groundwater resources in the County, efforts to collect additional data and information about Tompkins County's groundwater resources have been ongoing since 2002 through a cooperative study program of confined aquifers done jointly by Tompkins County, the applicable town(s), NYS, and the USGS.

Importance of Riparian Corridors

Riparian corridors are the lands bordering streams and represent a transition zone between aquatic and terrestrial ecosystems. Though riparian areas and stream buffers generally comprise a small proportion of the landscape, they provide a disproportionately high amount of habitat and ecosystem benefits, including protecting water quality, stabilizing streams, minimizing flood damages, and enhancing ecological diversity.

Adequately vegetated riparian corridors provide a variety of benefits. Vegetated stream buffers and other riparian areas can help improve water quality by capturing and filtering out sediments, nutrients, and other pollutants and by moderating stream temperatures. Buffers support aquatic ecosystems and enhance habitat and biodiversity by providing a supply of plant detritus as food for aquatic food webs, structural complexity for aquatic habitat, and shade for stream channels in summer. Other non-water resource benefits include providing terrestrial wildlife habitat and travel corridors, minimizing property damage from flooding, and reducing municipal investment in stormwater management infrastructure.

Scientific recommendations for appropriate buffer widths vary considerably and depend on the management goal. The minimum width of a vegetated stream buffer should be 100 feet to provide water quality and aquatic habitat protection benefits, 165 feet for stream bank stabilization and detrital input benefits, and 330 feet for wildlife habitat for terrestrial mammals.[6]

Importance of Wetlands

Wetlands such as swamps and marshes are often easily recognizable, but some wetlands, such as forested wetlands and wet meadows, are not obvious because they are dry during part of the year. The quality and quantity of wetlands also vary greatly depending on local conditions such as soil type, climate, hydrology, level of precipitation, and human disturbance.

According to DEC, “Freshwater wetlands are those areas of land and water that support a preponderance of characteristic wetlands plants that out-compete upland plants because of the presence of wetlands hydrology (such as prolonged flooding) or hydric (wet) soils. Freshwater wetlands commonly include marshes, swamps, bogs, and fens.”

Wetlands are a critical component of natural ecosystems and provide a variety of benefits such as: (1) filtering harmful toxins, nutrients, and sediment from surface and stormwater runoff; (2) storing floodwaters and reducing the magnitude of flood events; (3) providing valuable habitat for a diverse array of flora and fauna, including many rare, threatened, or endangered species; and (4) maintaining surface-water flow during dry

[6] Enhancing Water Resources in Tompkins County: Benefits of Riparian Areas and Stream Buffers. 2006. Tompkins County Planning Department.

periods. Landscape position influences wetland function, with headwater wetlands providing stream base-flow augmentation, and lower elevation wetlands providing floodwater storage. The recreational uses associated with wetlands are also very diverse and include bird watching, hunting, fishing, and botanical tourism, all of which provide direct economic benefits to local communities.

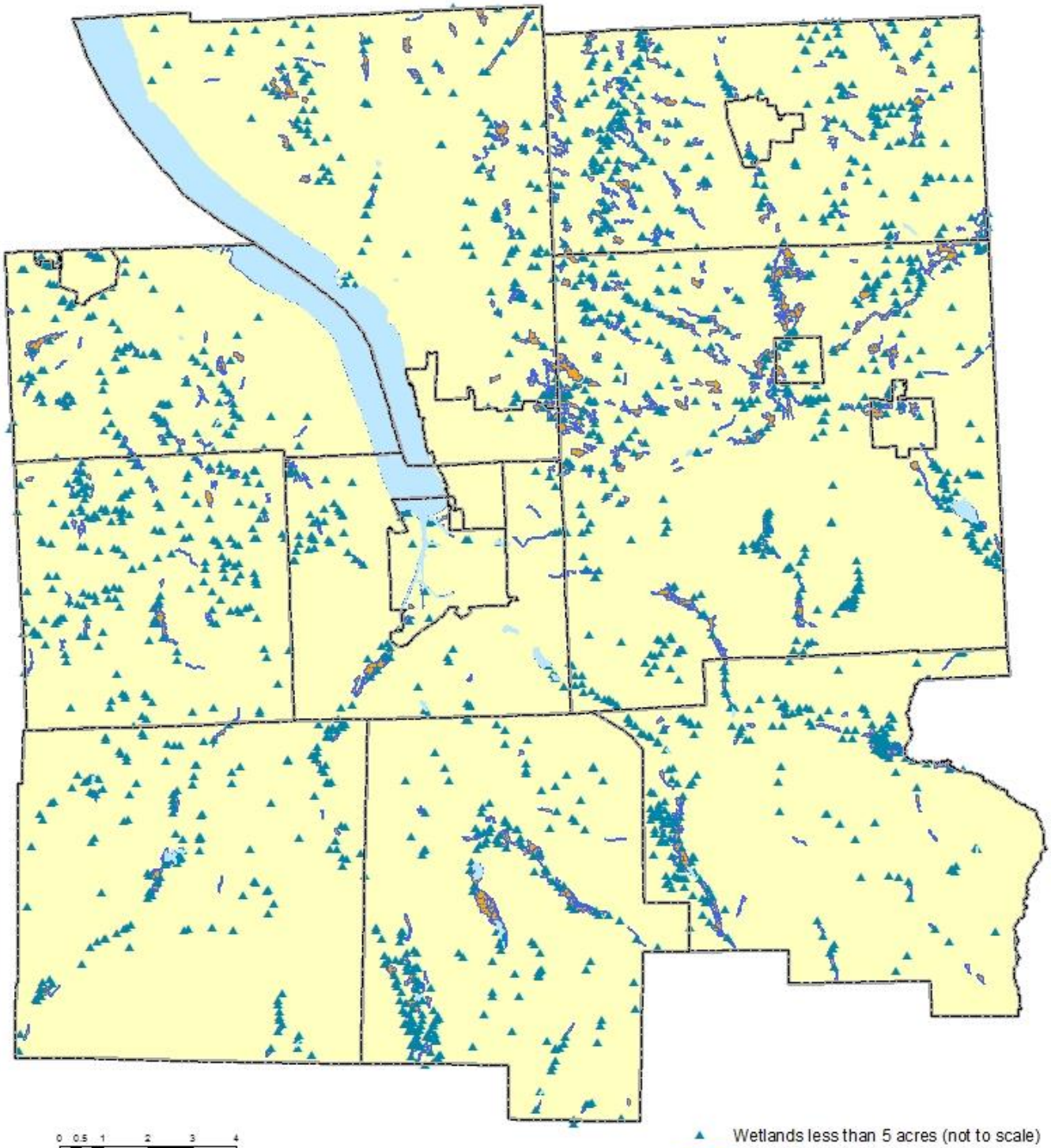
Tompkins County contains approximately 5,600 acres of NYSDEC regulated wetlands (wetlands of at least 12.4 acres unless they have unusual importance), and 19,800 acres of federally identified wetlands (including the NYSDEC regulated wetlands). While, historically, the federal government - through the Army Corps of Engineers - played an important role in protecting wetlands, U.S. Supreme Court decisions in 2001 and 2006 confused and complicated when streams and wetlands are protected by the Clean Water Act.

In 2014 the federal government proposed a Clean Water Rule to reduce confusion which became effective August 28, 2015. Federal law defines wetlands as areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions." In general practice, the U.S. Army Corps of Engineers, the federal agency that administers the Clean Water Act, considers isolated wetlands to be those that have no surface water connection to navigable waters or their tributaries. The change in acreage of wetlands under federal jurisdiction in Tompkins County is unknown.

While the New York State Department of Environmental Conservation and the U.S. Army Corps of Engineers regulate certain wetlands, there are additional steps that can be taken locally to protect and enhance wetlands.

- Wetland restoration projects can help provide some of the benefits provided by natural wetlands that may have been lost.
- Communities can educate landowners on the importance of wetlands.
- Municipalities can protect wetlands by considering wetlands in their comprehensive plans, zoning ordinances, and subdivision and site plan reviews.
- A municipality can adopt and enforce a wetland protection ordinance to protect wetlands that might not be protected under state and federal laws. The WRC has drafted a model ordinance.
- A local government can establish a wetland conservation easement program, similar to agricultural easement programs.

Tompkins County
National Wetlands Inventory



Source: National Wetlands Inventory
publication range 1979-1994

Tompkins County Planning Department

III. PROCESS FOR ASSESSING WATER RESOURCES

The priorities to be developed by the WRC in our WQS have been and will be substantially based on the NYS Department of Environmental Conservation (DEC) Priority Waterbodies List (PWL).

Waterbody Inventory/Priority Waterbodies List

NYSDEC maintains water resource information through its *Waterbody Inventory/Priority Waterbodies List (WI/PWL)* database. The *Waterbody Inventory* refers to a listing of all waters, identified as specific individual waterbody segments or Assessment Units, within the state. The Waterbody Inventory includes both assessed and currently unassessed waters. The *Priority Waterbodies List* is the subset of waters in the Waterbody Inventory that have documented water quality impairments, minor impacts, and/or threats. The WI/PWL assessments provide the foundation for both the State's compilation of the biennial Section 305(b) Water Quality Report on all waters of the state, and for the development of the state Section 303(d) List, which is comprised of waters that do not meet water quality standards, do not support water uses, and require development of a TMDL (Total Maximum Daily Load).[7]

DEC develops and updates the PWL using a combination of stakeholder input and DEC monitoring results. The PWL is updated on a statewide, five-year rotating schedule, and is used by DEC and other agencies as a primary resource for water resources management and funding. In Tompkins County, the southern end of Cayuga Lake is listed as impaired for bathing and recreation due to algal/weed growth, nutrients, and silt/sediment. Until 2014, Cayuga Lake was also listed as impaired by pathogens. This listing was removed based on data submitted to DEC by WRC members representing the Ithaca Area Waste Water Treatment Plant and the Community Science Institute.

For waters that are determined to be impaired, states must consider the development of a TMDL or other strategies to reduce the input of the specific pollutants. Impaired water-bodies and their related pollutants are published by DEC on the *New York State Section 303(d) List of Impaired/TMDL Waters*. The most recent list published in 2015 identified the southern end of Cayuga Lake as impaired by two pollutants: phosphorus and silt/sediment.

Most of the phosphorus that enters the southern end of Cayuga Lake is bound up with the sediment carried by Fall Creek, Cayuga Inlet, and Sixmile Creek. This sediment is largely the result of stormwater runoff and erosion of stream banks. The loss of natural wetlands in the valley at the south end of the lake that would act as sediment traps has contributed to sedimentation in the southern end of Cayuga Lake. A TMDL or other strategy to address phosphorus will likely need to address methods to reduce the amount of phosphorus found in these tributaries. In addition to sediment-bound phosphorus, phosphorus also enters the southern end of the lake from point sources, including wastewater treatment plants and the Cornell Lake Source Cooling heat exchange facility. It is easier to control/regulate point sources than non-point sources. In recent years, tertiary phosphorus treatment systems have been installed at the Ithaca Area Wastewater Treatment Facility and at the Cayuga Heights Wastewater Treatment Plant, significantly reducing their contributions of phosphorus.

As a condition of continuing the state discharge permit for the Lake Source Cooling facility, DEC and Cornell University agreed to conduct a detailed study of the sources and ultimate use of phosphorus in Cayuga Lake. The study will build a mathematical water quality model of Cayuga Lake and its watershed and a detailed analysis of the shallow southern end of the lake in order to provide a better understanding of where phosphorus

[7] More detail regarding the WI/PWL assessment effort can be found on the NYSDEC website at http://www.dec.ny.gov/chemical/23846.html.

comes from and how it affects the lake ecosystem. Once completed, the model will help DEC determine whether a TMDL or other strategy is necessary to address the amount and concentration of phosphorus in the southern end of Cayuga Lake. Completion of the model is expected in 2016.

According to DEC, the continued implementation of nutrient reduction requirements at larger CAFO farms, as well as voluntary measures taken at smaller farms, are expected to provide the required "reasonable assurance" that TMDL loads will be met. For agricultural sources, the plan aims to achieve the reductions through continued implementation of farmstead and field conservation practices aligned with farm goals and watershed needs. Practices such as cover crops, conservation tillage, crop nutrient management, manure storage, grazing, fencing livestock out of streams, grass buffers, and controlling runoff from barnyards that are implemented by farms will be credited by the Cayuga Lake Watershed Model toward the phosphorus reduction goals established by any TMDL. Achieving the overall reduction outlined in a TMDL may be challenging.

Classification of Waters. All waters of the state are provided a class and standard designation based on existing or expected best usage of each water or waterway segment.

- Classification AA or A is assigned to waters used as a source of drinking water.
- Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water.
- Classification C is for waters supporting fisheries and suitable for non - contact activities.
- The lowest classification and standard is D.

Waters with classifications A, B, and C may also have a standard of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning (TS). Special requirements apply to sustain these waters that support these valuable and sensitive fisheries resources.

Certain waters of the state are protected on the basis of their classification. Streams and small water-bodies located in the course of a stream with a classification of AA, A, or B, or with a classification of C with a standard of (T) or (TS) are collectively referred to as "protected streams," and are subject to the stream protection provisions of the Protection of Waters regulations.

Small ponds and lakes with a surface area of 10 acres or less, located within the course of a stream, are considered to be part of a stream and are subject to regulation under the stream protection category of NYS DEC Protection of Waters program.

Environmental Resource Mapper. The Environmental Resource Mapper (ERM), a new web-based interactive mapping application developed by DEC that can be used to identify protected streams based on their classification. ERM can also be used to create simple maps that can be submitted as part of the Protection of Waters Permit Application process, or contact the Department of Environmental Conservation regional office responsible for the area in which the watercourse is located.

EPA is promoting an overhaul of the 303(d) program that will allow for methods other than TMDL's to be used to improve water quality. The overhaul will also give states more flexibility to prioritize water bodies and provide protection for high priority water bodies that are not currently impaired. NYS DEC is in the process of implementing this program.[8]

[8] More information can be found at EPA's website:
http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/programvision.cfm

Other Watershed Plans

Previous versions of the WQS used the following watershed plans to further define goals and objectives:

- Upper Susquehanna Coalition's Watershed Restoration and Protection Strategies
- Owasco Lake Watershed Management Plan
- Cayuga Lake Watershed Restoration and Protection Plan (RPP)

Upper Susquehanna Coalition's Watershed Restoration and Protection Strategies

In 1998, EPA mandated that states identify watersheds in need of restoration and develop a schedule for addressing identified priorities. As part of this effort, DEC initiated the Unified Watersheds Assessment (UWA) process and categorized all major watersheds in NY State based on their need for remediation. Because of strong stakeholder support and the availability of recent monitoring data, the Susquehanna and Chemung River basins were chosen as a pilot for the UWA and subsequent Watershed Restoration and Protection Strategies (WRAPS) processes.

The Upper Susquehanna plan has not been updated, however, the Tompkins County Soil & Water Conservation District has completed several projects in that watershed that are in line with the goals of the plan. The Upper Susquehanna plan was completed under the WRAPS process (Watershed Restoration and Protection Action Strategy). The WRAPS program has been superseded by EPA's new 303(d) Vision Program.

Owasco Lake Watershed Management Plan

The development of the Owasco Lake Watershed Management Plan (finalized in July 2001) was the result of collaboration, cooperation, and work of agency staff, municipal officials, and the public throughout the watershed. Owasco Lake and its tributaries are an important resource to the communities within the watershed. Owasco Lake provides municipal water to 44,000 Cayuga County residents via the City of Auburn and Town of Owasco water filtration plant. Tompkins County is the headwaters of the Owasco Lake Inlet Watershed, a large portion of which falls within the Town of Groton and smaller portions within the Towns of Dryden and Lansing.

The Owasco Lake plan has not been updated and is not currently being used by Tompkins County to guide work. However, the Plan led to the 2007 codification of watershed rules and regulations that are enforced by the watershed inspector. The Watershed Inspection Program was established through an agreement between the City of Auburn, Town of Owasco, county agencies, and other Owasco Lake advocates and works closely with the Cayuga County SWCD. The Program operates in accordance with NYS Public Health Law, and employs both a watershed specialist and inspector. The specialist and inspector perform a variety of tasks to ensure the ecological health of Owasco Lake and its tributaries.

Cayuga Lake Watershed Restoration and Protection Plan

The Cayuga Lake RPP is currently being updated through a joint effort of the Cayuga Lake Intermunicipal Organization (IO) and the Cayuga Lake Watershed Network (CLWN). The WRC will follow the progress of the update and review the plan when it is complete. The RPP characterization of Cayuga Lake originally included compilation and synthesis of existing data, including those from universities and government agencies. New data were also collected through studies commissioned by the IO. The Technical Advisory Committee (TAC) of the IO was responsible for characterization of the ground and surface water quality; issues and potential and existing sources of ground and surface water contamination in the watershed were identified and prioritized.

Tompkins County Agricultural Environmental Management (AEM) Strategic Plan

The Agricultural Environmental Management (AEM) Program is managed by the New York State Department of Agriculture and Markets, in partnership with the United States Department of Agriculture, the New York State Soil and Water Conservation Committee, and the 53 County Soil and Water Conservation Districts (SWCDs) across the state. The AEM program is part of NYS Ag & Markets law and is in place to provide all state SWCDs with a consistent level of non-competitive funding and a uniform methodology to help manage farms in an environmentally responsible manner. As a statewide recognized planning and implementation tool the AEM program makes it possible for a greater number of farms to access various cost-share grant programs to improve environmental practices while also documenting current best management strategies as they pertain to natural resources.

The Tompkins County AEM five-year strategic plan was adopted by the Tompkins County Soil and Water Conservation District Board of Directors in 2015 to guide the program through 2019. The plan breaks out by watershed important water quality issues and concerns that can be addressed by improved agricultural best management practices. The priority watersheds (in rank order) that will be addressed on a farm-by-farm basis are Fall Creek, Salmon Creek, Owasco Inlet, Cayuga Inlet, and Taughannock Creek. The priority resources, issues, and concerns contained in the document were identified from the NYS PWL, stakeholder meeting input, and other plans mentioned above.

IV. TOMPKINS COUNTY WATER RESOURCE PRIORITIES

Although the resolution creating the WRC calls for establishing priorities for action, to date it has seemed sensible to work in parallel on five areas: Cayuga Lake, Cayuga Lake tributaries and watersheds, aquifers, tributaries to Lake Ontario, and tributaries to the Susquehanna River and Chesapeake Bay. Priorities, yet to be developed by the WRC, will attempt to reflect the importance of each water body to the people of Tompkins County.

Surface Water

Cayuga Lake is considered the number one priority overall because of its size and many uses and because most of Tompkins County lies within its watershed. However, since Cayuga Lake is the ultimate receiver of the majority of Tompkins County's surface water resources, immediate attention needs to be given to its major tributaries. It is a drinking water source to a large percentage of residents of the county and serves many of the other residents in various capacities. Protecting its water quality requires protecting the contributing surface water and groundwater sources, riparian corridors, and wetlands within the watershed.

Beyond the lake, surface water and groundwater rankings will be based on scientific data, the interaction with and the impact on the larger watershed to which it contributes, and the major use(s) of the individual water body. The WRC determined that the data and information in both the Cayuga Lake Watershed Preliminary Characterization and the Cayuga Lake RPP should guide priority rankings for all water bodies in that watershed. Priorities in Tompkins County reflect and are consistent with priorities and needs of the watershed as a whole. Information from the DEC's PWL was also used and combined with the data from the characterization and the RPP to establish priorities.

Tompkins County also has tributaries that are the headwaters for other major watersheds, including Owasco Inlet, which flows into Lake Ontario, and the Susquehanna River, which flows into the Chesapeake Bay. Because of the importance of these tributaries to not only the residents of Tompkins County but to our neighboring counties and the watersheds overall, these have been ranked separately. These water bodies are no

less important than those of the Cayuga Lake watershed, and it seems unreasonable to prioritize them on a comparative basis with Cayuga Lake and its tributaries. Specific water bodies have unique challenges and affect the larger water bodies to which they contribute. Our challenge is to address them in the appropriate manner.

Other data related to the watershed stem from a variety of monitoring activities and projects. These will be identified and consolidated, especially those stemming from the Sixmile Creek and Fall Creek monitoring groups.

Groundwater

As mentioned above, there is a paucity of groundwater information in Tompkins County. The DEC's Priority Waterbodies List (PWL) does not include groundwater; the IO's RPP barely touches on groundwater. To help address these gaps, the USGS published a reconnaissance-level map in 2000 showing the extent of unconsolidated aquifers in Tompkins County. Data used to develop this map included: (1) water-well drillers logs, (2) highway and other construction test-boring logs, (3) well data gathered by the Tompkins County Department of Health, (4) test-well logs from geohydrologic consultants that conducted projects for site-specific studies, and (5) well data collected during past investigations by USGS and entered into the National Water Information System database.

In 2002, Tompkins County, at the recommendation of the Planning Department, began a countywide aquifer study to learn more about aquifers in Tompkins County by conducting investigations of 17 aquifer reaches. To date, the studies of five aquifer reaches have been completed, another is in preparation for publication, and two are presently under investigation. (See map in previous section.)

Since 2000, DEC has required water-well drillers to provide a well completion report (well log) to the well owner and to the State. The log indicates well construction, type of material the well penetrated, and details such as the location, well depth, length of casing, and yield of the well.

Informational resources for assessing potential sources of groundwater contamination include the Tompkins County Abandoned Landfills map (available for review in the office of the Tompkins County Planning Department), and "An Evaluation of Risks Associated with Underground Storage Tanks in Tompkins County" initiated by the Tompkins County Environmental Management Council in cooperation with the Tompkins County Department of Health and the then Tompkins County Board of Representatives (February 1991).

Another source of information about groundwater and potential sources of contamination are the Source Water Assessment Reports prepared for each community public water system in 2002-2005 by the NYS Health Department or its consultant. These reports identify inner and outer assessment zones for wells, and potential contaminant sources (sewage systems, fuel storage areas, mines, etc.) within these zones. The sources are assigned a risk based on the type of land use, geology, size and number of contaminant sources, and past water-quality history.

Riparian Corridors

There is limited information available on riparian corridors in Tompkins County in the Cayuga Lake Watershed Preliminary Watershed Characterization and the RPP. The RPP cites significant development (38-81% area developed) along all tributaries in the Cayuga Lake watershed.

Wetlands

The DEC classifies wetlands according to their functions, values, and benefits, and this classification serves as a useful guideline for establishing priorities for wetland protection (see Part 664 of the New York State DEC

Rules and Regulations[9] for the complete classification). Four ranked regulatory classes of wetlands are defined by the DEC, with Class I wetlands considered to be the most valuable. The National Wetlands Inventory (NWI) classification does not rank wetlands or consider function; it is based primarily on soil composition, vegetation, hydrology, and water chemistry. Information on NYSDEC-designated and federally designated wetlands is readily available, and other sources of information also exist (Tompkins County Natural Resources Inventory, Cayuga Lake Watershed Preliminary Watershed Characterization, and the RPP).

As noted in Section II of this document, the final Clean Water Rule that is intended to clarify the types of waters, including streams and wetlands, protected by the federal government was published in the June 29, 2015, Federal Register and became effective August 28, 2015. At the state level, the DEC regulates wetlands of at least 12.4 acres in size, and smaller wetlands of unusual local importance. Taken together, these regulations have the effect of leaving responsibility for regulation of isolated wetlands of less than 12.4 acres to local governments. Identification and protection of these otherwise unregulated wetlands is also a priority.

The WRC did a pilot study and found that between 8% and 19% of the wetland acreage surveyed may no longer be regulated under the Clean Water Act because they are geographically isolated or lack a significant influence on navigable water. Wetlands and riparian corridors can be protected in Stormwater Management Laws or by adopting stand-alone wetlands and riparian corridor protection laws, such as the sample law approved by the Water Resources Council. With funding from the County and the Park Foundation, the WRC is partnering with the Cayuga Lake Watershed Network and a local consultant to identify and map all wetlands in the County using remote sensing data. A pilot effort focused on the Town of Dryden (Tompkins County's largest town) and found 5,641 acres of wetlands, which is 2,406 acres more, and with different boundaries than, wetlands identified by the NWI. When completed in 2016, municipalities in the County could use the wetlands maps to support the adoption and implementation of a wetlands protection law and planning and development will have better reference information.

V. GOALS AND ACTION ITEMS

Goals

The action items of the 2015 Water Quality Strategy are in accordance with the six goals established in prior WQS documents:

- Goal A: Protect and enhance surface water quality.
- Goal B: Protect and enhance groundwater quality and quantity.
- Goal C: Protect and restore riparian corridors.
- Goal D: Protect and restore wetlands.
- Goal E: Participate in the creation and implementation of relevant watershed plans and initiatives that impact Tompkins County.
- Goal F: Educate and inform municipal officials, the public, professionals, agency staff and the media about water quality concerns and protective policies and practices.

The action items have been selected and prioritized in consideration of the purview and resources of the WRC, as well as their timeliness and council member interests and abilities.

[9] http://www.dec.ny.gov/regs/4612.html

Priority Action Items for the Water Resources Council

Participate in the update of the NYS Section 303(d) List of Impaired/TMDL Waters. The 303(d) List is updated by the NYS DEC and the US Environmental Protection Agency (USEPA) every two years and there are two opportunities for input – providing water quality data and commenting on the Draft 303(d) List. Schedule of DEC/USEPA Activities for 2016 update: June-Sept 2015 Solicit existing water quality data and information; Oct-Dec 2015 Review data and information and develop Draft 303 List; Jan-Feb 2016 Public Notice and Comment Period for Draft List; April 2016 Submit Proposed Final List to USEPA; June 2016 USEPA approval of Final List.

Level of Effort Required:	Low-Moderate	Likely Schedule:	Annual

Keep municipal and county officials informed of existing federal/state/local wetland regulations and changes to those regulations. This action will require keeping up-to-date on newly enacted regulations, assessing how those regulations may impact Tompkins County, and sharing this information with appropriate officials.

Level of Effort Required:	Low for monitoring, Moderate when there are changes	Likely Schedule:	Year-Round

Provide comment on the High Hazard Pipeline Inventory. The project is managed by the County Planning Department and undertaken by an engineering consultant. An opportunity to review and comment on the draft Inventory is expected in Spring 2016.

Level of Effort Required:	Low	Likely Schedule:	2016

Encourage completion of watershed assessments on remaining watersheds and disseminate resulting information. Watershed assessments have been conducted for the Sixmile Creek, Fall Creek, Salmon Creek, Cayuga Inlet, and Taughannock Creek watersheds. The other major watersheds yet to be completed are Owasco Inlet and Cascadilla Creek. The County Planning Department has overseen these assessments as funding from the Stream Corridor Restoration and Flood Hazard Mitigation Program is available to hire a consultant.

Level of Effort Required:	Low	Likely Schedule:	2016

Continue participation in DEC's Modeling Study/TMDL development activities. This includes participation on the Technical Advisory Committee and regular discussions with DEC, Cornell University, and the organizations undertaking the monitoring and modeling projects. Schedule of Activities: 2013 Monitoring/Data Collection; 2014-15 Model Development; 2015-16 Model Evaluation; 2016-17 TMDL Development; May 2017 Draft TMDL; Sept 2017 Final TMDL

Level of Effort Required:	Moderate	Likely Schedule:	2016-18

Develop a systematic approach to data collection and analysis for potential pollutants.
In broad terms, these steps should be (1) collate existing data, (2) identify data gaps, (3) develop a monitoring program to fill data gaps, (4) analyze existing data, (5) develop a long-term sustainable monitoring program to track pollutant. Pollutants to consider could include: phosphorus, sediment, pesticides, micro-plastics, nitrogen, and emerging contaminants.

Level of Effort Required:	Very High	Likely Schedule:	2016-18 and beyond

Review existing watershed rules and recommend appropriate changes.
Water purveyors have the authority to establish watershed rules to protect surface water drinking water supplies. In Tompkins County, watershed rules were established by the City of Ithaca and Cornell University decades ago to protect their supplies in the Sixmile Creek and Fall Creek watersheds, respectively. Watershed regulations have also been codified for the Owasco Lake watershed to protect public drinking water supplies in the City of Auburn and the Town of Owasco in Cayuga County. These regulations apply to the portion of that watershed within Tompkins County. The Bolton Point Water System drafted watershed regulations in 1993, but they were never adopted.

Level of Effort Required: Moderate Likely Schedule: 2017-18

Develop a workshop for municipal officials on the importance of local actions to protect stream corridors, wetlands, and aquifer recharge areas.
The workshop should present a variety of actions that local governments could take to protect these important resources. The workshop should be designed to be offered every few years.

Level of Effort Required: High first year, Moderate in subsequent years Likely Schedule: 2017 offer workshop every 2-3 years

Evaluate the level of protection of existing groundwater sources used for municipal and individual supplies.
This activity should identify existing public water supplies (available from the County Department of Health), assessing the type of groundwater resources (confined/unconfined aquifer), identifying aquifer recharge areas or appropriate wellhead protection areas, and determining any local/county/state requirements for protecting these resources.

Level of Effort Required: Moderate Likely Schedule: 2018 and beyond

General On-Going/Administrative WRC Tasks

In addition to the action items identified above, the Water Resources Council undertakes other actions, some unrelated to water quality and others of an on-going or administrative nature. The latter are partially listed below.

- Update the Tompkins County Water Quality Strategy every three years.
- Report annually (in April) to the relevant committee of the Tompkins County Legislature about the accomplishments of the WRC.
- Provide a venue for water organizations to communicate with each other and the public.
- Take a role in tracking and participating in DEC regulatory, permitting, and enforcement actions.
- Participate in opportunities to comment on projects: for example, dredging, gas drilling operations, City Water Treatment options.
- Seek funding for water quality strategy actions.
- Identify emerging contaminants and issues and identify appropriate action (research, education, etc.).
- Refresh WRC website.
- Update, as needed, existing brochures on paddling, watercraft regulations, watershed agencies, and arsenic in wells.

Action Items to be Considered by Others

In preparing this Water Quality Strategy, the Council identified a number of actions which were more appropriately addressed by other organizations.

- Promote the use of Best Management Practices and buffers on agricultural lands to control erosion and runoff from farm fields and farmsteads. [SWCD]
- Promote the voluntary USDA Conservation Reserve Enhancement Program (CREP) for livestock exclusion from streams. [NRCS]
- Promote participation of agricultural operations in voluntary environmental risk evaluation (AEM process) and voluntary state and federal cost share programs to protect and enhance water quality. [SWCD]
- Implement policies to reduce the use of road salt, or other chemicals that may impact water quality, by road maintenance organizations. [Municipalities]
- Promote intermunicipal cooperation for compliance with EPA/DEC Phase II Stormwater Regulations. Foster public awareness, participation, and education on this issue. [SCTC]
- Prepare annual report on stormwater permit implementation and compliance. [SCTC]
- Promote intermunicipal cooperation and establish a schedule for the use of the County Street Sweeper/Vacuum truck. [County Highway Division]
- Promote monitoring efforts in the Owasco Lake Watershed within Tompkins County. [Owasco Lake Watershed Inspector]
- Work with citizen monitoring groups, CSI and others to collate monitoring data for the Owasco Lake watershed in Tompkins County and report information to DEC on a Priority Waterbodies List (PWL) worksheet to assist DEC in updating the PWL. [Owasco Lake Watershed Inspector]
- Support coordinated stormwater management practices. [SCTC]
- Determine status of stream biota health. [several agencies]
- Promote continued operation of existing stream gages on Cayuga Lake tributaries and assist in identifying funding sources for that purpose. [USGS]
- Initiate new aquifer studies under the County's Aquifer Study Capital Program. / Complete aquifer studies. [USGS]
- Map the location of all on-site wastewater treatment systems and individual water supplies using GIS. [TCHD]
- Provide oversight of operation of existing individual septic tanks. [TCHD]
- Update the Cayuga Lake Watershed Restoration and Protection Plan. [IO]
- Report to WRC on the Tompkins County Legislature's and constituent municipalities' work to support the Cayuga Lake Intermunicipal Organization (IO) agreement and implementation of the Restoration and Protection Plan. [IO]
- Report to WRC on the Tompkins County Legislature's, constituent municipalities' and the Upper Susquehanna Coalition's work in support of the Susquehanna Tributary Strategy. [USC]
- Report to WRC on the Tompkins County Legislature's and constituent municipalities' work in support of the Owasco Lake Watershed Management Plan. [Owasco lake Watershed Inspector]
- Educate agricultural operations about the voluntary state environmental risk evaluation (AEM process) and cost share programs to implement practices to protect and enhance water quality. [SWCD]
- Provide education to contractors, developers, municipal highway employees, municipal officials, and code enforcement officers on erosion control, storm water regulations and protection. [SCTC]
- Promote the Stream Corridor Protection Program. [TCPD]
- Educate the public, municipal officials and others on issues related to invasive aquatic species. [CCETC]
- Update floodplain maps. [FEMA/DEC]
- Undertake channel maintenance in the City of Ithaca. [City of Ithaca]
- Promote the Cayuga Lake Intermunicipal Organization. [IO]
- Inventory roadside erosion potential. [SCTC]
- Promote stream corridor protection efforts, including the stream buffer planting guide, riparian protection agreements with landowners; and model stream buffer ordinances. [TCPD]

Action Items Suggested, but not Included

In preparing the Water Quality Strategy, a number of potential action items were identified. Some are action items from the most recent Water Quality Strategy, some were identified during brainstorming sessions, and others were action items suggested in other water resources plans. These are listed here for reference.

- Promote stenciling of all storm drains.
- Provide public education on discharge of wastewater from boats.
- Determine the carrying capacity of Cayuga Lake for boating activity.
- Provide buoys within 500 feet of water intakes in Cayuga Lake.
- In concert with landowners and lessees, support regulations and programs that encourage riparian corridor protection and restoration.
- Promote non-polluting recreational uses of Cayuga Lake, such as non-motorized boats and photography.
- Update and reprint as needed brochures about watercraft regulations and recreational boating concerns in Tompkins County.
- Promote training opportunities for local municipal staff (Code Enforcement Officers) for enforcement of existing individual water supply regulations.
- Conduct Water Week activities.
- Complete and update annually a brochure of local water/watershed agencies and organizations for distribution, such as at Water Week.
- Raise awareness of watershed issues with youth groups and schools.
- Provide public education on the public/private responsibility for water quality.
- Identify practices of pharmacies that accept unused drugs for disposal.
- Expand WRC membership to include watershed representatives from each municipality.
- Develop incentives for stream buffer protection.
- Evaluate existing wetland educational and planning materials for use in promoting the protection of wetlands.
- Investigate possibilities for web-based dissemination of information on wetlands.
- Provide education to landowners on erosion control.
- Educate residents about how everyday activities (lawn care, use and disposal of pharmaceuticals, etc.) impact water quality.
- Keep municipal and county officials informed of existing federal/state/local wetland regulations and changes to those regulations as deemed appropriate.
- Collaborate with other organizations (e.g., Cayuga Lake Network, IO, Floating Classroom, TCHD) on educational activities that further WQS goals. / Collaborate on educational activities with other watershed organizations such as the Floating Classroom, the SWCD, the SCTC, and the Hydrilla Task Force.
- Provide public education on the byproducts of Stage II disinfectants used by water purveyors.
- Provide public education on aquatic plants
- Identify and educate the public on new regulations affecting water purveyors.
- Establish a Lake-Friendly Farm program to recognize individual efforts to reduce water quality impacts of agricultural operations.
- Provide public education on pollution by microbeads and microplastics.
- Change attitudes about having perfect lawns.
- Track SPDES Permit Violations at the Cayuga Power Plant
- Provide assistance to municipalities that wish to protect groundwater sources through local programs.
- Promote intermunicipal cooperation for the protection of riparian corridors.
- Develop long-term strategy to assist County and local municipalities with easement stewardship responsibilities.
- Acquire and collate wetland delineation data from major projects and municipal reviews.

- Develop a framework that will utilize municipal and community goals (such as protection of groundwater and surface water quality, flood storage, and habitat conservation) and activities (such as land development projects and community-based stewardship) to promote the protection of functions provided by wetlands. / Collaborate with municipalities and local organizations to [align/integrate/etc.] community goals and activities to promote the protection of wetlands and the functions they provide. This framework can incorporate existing municipal and community goals and activities, such as protection of groundwater and surface water quality, flood storage, habitat conservation, land development projects, and community-based stewardship.
- Identify the status of local wetland regulations and provide assistance to municipalities, on request.
- Delineate wetlands in the County.
- Provide information for the next anticipated 2016 US EPA Clean Watersheds Needs Survey (2015).
- Establish a coordinated response team for managing newly identified invasive aquatic species infestations.
- Work with municipalities/IO/agencies to secure funding for erosion control.
- Work to secure FL-LOWPA funding for erosion control.
- Create a surface water data-sharing structure.
- Encourage development of a stream sediment-monitoring program.
- Promote monitoring efforts in the Upper Susquehanna Watershed within Tompkins County.
- Characterize nutrient loading in small watersheds
- Investigate types and sources of groundwater data currently being collected.
- Evaluate the impact of pollution from pesticides.
- Evaluate bio-solids spreading potential for water contamination and identify appropriate actions.
- Investigate and evaluate potential pollution from AES (Milliken Station) power plant ash pile runoff and others points on the site.
- Identify circulation patterns in Cayuga Lake.
- Develop a database of well logs.

ACRONYMS

BACI	Before After Control Impact
CCETC	Cornell Cooperative Extension of Tompkins County
CHWWTF	Cayuga Heights Waste Water Treatment Facility
CLWN	Cayuga Lake Watershed Network
CSI	Community Science Institute
EMC	Tompkins County Environmental Management Council
EPA	United States Environmental Protection Agency
FLI	Finger Lakes Institute
FL-LOWPA	Finger Lakes-Lake Ontario Watershed Protection Alliance
IAWWTF	Ithaca Area Waste Water Treatment Facility
IO	Cayuga Lake Watershed Intermunicipal Organization
KLA	Keuka Lake Association
LSC	Lake Source Cooling
MS4	Municipal Separate Storm Sewer System
NRCS	Natural Resources Conservation Service
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OWLA	Owasco Watershed Lake Association
PRISM	Partnership for Regional Invasive Species Management
PWL	Priority Waterbodies List
RPP	Cayuga Lake Restoration and Protection Plan (prepared by the CLWN)
RUSS	Remote Underwater Sampling Station
SEQR	State Environmental Quality Review
SMP	Strategic Monitoring Plan (for the southern basin of Cayuga Lake)
SPDES	State Pollutant Discharge Elimination System
SWAR	Source Water Assessment Report
SCTC	Storm Water Coalition of Tompkins County
SWCD	Soil and Water Conservation District
TCHD	Tompkins County Health Department
TCL	Tompkins County Legislature
TCPD	Tompkins County Planning Department
(TC)SWCD	Tompkins County Soil and Water Conservation District
TMDL	Total Maximum Daily Load
UFI	Upstate Freshwater Institute
USC	Upper Susquehanna Coalition
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WQS	Water Quality Strategy
WRC	Tompkins County Water Resources Council
WRR	Watershed Rules and Regulations