

WATER BODIES

Why are Water Bodies Important?

Tompkins County is dominated by significant water bodies (lakes, ponds, rivers, and streams) that are critical to public health and the economic and environmental well being of this area. Economic and environmental activities dependent on the integrity of local water bodies and water supplies include tourism, agriculture, industry, recreation, education and research, and real estate. Although wetlands are important components of environmental and economic systems, federal and state agencies consider wetlands to be distinct from water bodies for regulatory purposes.

Although water bodies and water supplies are abundant in Tompkins County, certain activities can adversely affect the ecological balance within water bodies, impairing their current and potential economic and environmental functions. Threats to local water supplies include both point source pollution (often thought of as a single pipe draining a water body) and nonpoint source pollution (which is broader in nature and originate from construction, agriculture, parking lot and street runoff, stormwater runoff, on-site wastewater systems, and commercial and residential activities).

How are Water Bodies Regulated?

Federal and state agencies, such as the New York State Department of Environmental Conservation (DEC) and United States Army Corps of Engineers (Army Corps), require permits for activities that might affect or disturb a water body and/or its banks. The stringency of these permits corresponds with the DEC classification assigned to the water body (see below) and may range from a general, or unified, permit to a permit tailored to the specific site and type of work conducted. Regulated activities might include streambank maintenance, construction, flood protection and mitigation, dredging, placing fill, and certain agricultural practices.

Commercial, industrial, and agricultural activities that discharge to a water body require a State Pollution Discharge Elimination System (SPDES) permit. This permit is required for a broad range of activities, including the discharge of wastewater, stormwater, or chemical and thermal emissions from municipal treatment plants, industrial plants, utilities, large subdivisions, apartment complexes, and confined animal feeding operations.

Prior to conducting stream-related work or discharging wastewater, the Region 7 Office of the DEC or the Army Corps Buffalo District should be contacted to obtain the necessary approvals and permits. Each of these agencies will automatically forward permit applications to the other, and each agency will contact the applicant if additional permits and/or paperwork are needed.

How are Water Bodies Classified?

The DEC has assigned most water bodies within the state a letter based on their existing or expected “best use.” The most pristine waters are assigned a classification of AA; while the most degraded waters are assigned a classification of D.

Table 1: Stream Classifications

Class	Best Use
AA	Drinking (after chlorination)
A	Drinking (after chlorination and filtration)
B	Bathing
C (T)	Fishing (trout)

C	Fishing
D	Secondary contact recreation
Source: New York State Department of Environmental Conservation	

Additional classifications of “T” or “TS” can be added if a water body has sufficient amounts of dissolved oxygen to support trout and trout spawning. Water bodies that are designated as “C (T)” or higher (i.e., “C (TS)”, “B”, or “A”) are collectively referred to as "protected streams," and are subject to additional regulations.

Periodically, the DEC publishes the Priority Waterbodies List (PWL), which includes a list of water bodies that do not meet their designated “best use” classification. A data sheet that describes the conditions, causes, and sources of water quality degradation for each of the respective listings is also included in the PWL. The PWL is used by the DEC and other agencies as a primary resource for water resources management and funding.

Water Bodies in Tompkins County

Many of the water bodies of Tompkins County (streams, lakes, and ponds) are designated as protected streams due to their importance as drinking water supplies or fish habitat. See the following map for the location of protected streams in Tompkins County.

Fish resources are a key factor in determining water body classifications because they are the top of the food chain in aquatic habitats. As such, fish can be used as an indicator of the overall quality of an aquatic ecosystem. They are highly vulnerable, both directly and indirectly, to changes in their environment. They can be directly affected by physical and chemical changes in the water, and indirectly affected when changes in the environment affect their food sources or the temperature and turbidity of their habitat.

Cayuga Lake includes two interrelated assemblages of species, one in the shallow (littoral) zone and the second in the deep-water zone. In Tompkins County, the shallow zone is limited to the southern lake basin and a narrow fringe along the lake margins where light reaches the bottom.

The shallow zone is home to a warm water fish community dominated by Smallmouth Bass. Other important predator fish in the shallow-water community include Largemouth Bass and Northern Pike. These species prey on Yellow Perch, Pumpkinseeds, Bluegills, Rock Bass, and Minnows. Southern Cayuga Lake also supports a spawning population of White Suckers.

Lake Trout, Rainbow Trout, Brown Trout, and Landlocked Salmon are the dominant predators in the deep-water community. Of these salmonids, only the Lake Trout is native to Cayuga Lake. Populations of the Brown and Rainbow Trout, Landlocked Salmon, and Lake Sturgeon are maintained (or, in the case of Rainbow Trout, supplemented) by stocking. Juvenile salmonids prey on zooplankton. The quantity of zooplankton is considered to be the limiting factor for the growth and survival of Cayuga Lake’s most important sport fish, stocked juvenile lake trout. The Alewife is the predominant forage species. Other prey species include Rainbow Smelt, Troutperch, and Slimy Sculpin.

The New York State Department of Environmental Conservation (DEC) has designated several creeks in Tompkins County as protected partially for the purposes of fish habitat. The DEC stocks these creeks with various species of fish. Buttermilk Creek, Enfield Creek, Fall Creek,

Salmon Creek, Six Mile Creek, and Virgil Creek are stocked with Brown Trout. Rainbow Trout are stocked in Salmon Creek, and Landlocked Salmon are stocked in Owasco Inlet.

Maps and Data

Information about protected streams in Tompkins County was copied from the DEC Region 7 Protected Stream maps. For a map of this information, in paper or digital format, contact the Tompkins County Planning Department.

The PWL and maps of protected streams can also be viewed at the Tompkins County Soil and Water Conservation District. For information about permitting, contact the Region 7 DEC Office or the Army Corps of Engineers. Additional information about the PWL can be obtained from the New York State Department of Environmental Conservation (DEC)'s Division of Water.

Resources and References

Army Corps of Engineers, Buffalo District (Attention: Regulatory Branch), 1776 Niagara St., Buffalo, NY, 14207-3199, 716-879-4330.

New York State Department of Environmental Conservation, Div. of Water, 625 Broadway, Albany, NY 12233, 518-402-8233: <http://www.dec.state.ny.us/website/regs/ch10.htm>
<http://www.dec.state.ny.us/website/dcs/streamprotection/index.html>

New York State Department of Environmental Conservation, Region 7 Office, 615 Erie Blvd. West, Syracuse, NY 13204-2400, 315-426-7403.

Tompkins County Planning Department, 121 East Court Street, Ithaca, NY 14850, 607-274-5560.

Tompkins County GIS Program, Information Technical Services, 128 East Buffalo Street, Ithaca, NY 14850, 607-274-5418.
<http://www.tompkins-co.org/gis>

Tompkins County Soil and Water Conservation District, 903 Hanshaw Rd, Ithaca, NY 14850, 607-257-2340.

WATERSHEDS

What is a Watershed?

A watershed is the land area that contributes water to a given point, such as a stream or lake. Contributing sources of water for a watershed include (but are not limited to) springs, streams, seeps, ditches, culverts, marshes, wetlands, swamps, and ponds. Eventually, all surface water, some groundwater resources, and precipitation falling within a watershed, drain into a single receiving water body such as a stream, river, lake, or wetland. A watershed boundary is usually delineated by connecting the highest elevation points in the area.

Watersheds exist at various scales within a hierarchical structure. Gullies and ravines trickle into streams, which in turn feed into larger streams or rivers. Each of these water bodies (gully, ravine, stream, etc.) drains its own particular watershed so that larger watersheds are comprised of several smaller watersheds. For example, the Virgil Creek watershed flows into the Fall Creek watershed, which is contained within the larger Cayuga Lake watershed. While the term watershed is often used interchangeably with “drainage basin”, the term drainage basin usually refers to a larger watershed such as the Susquehanna River Drainage Basin or the Lake Ontario Drainage Basin.

Why are Watersheds Important?

Land use throughout a watershed (or the commercial, industrial, agricultural, and/or residential activities a land area can support) and the availability of reliable water sources within a watershed are directly related. That is, the land use in a particular area is often determined by the availability of reliable water supplies; and the single most important determinant of the quality, quantity, and availability of local water resources is land use. Because of this dynamic relationship between water and land use, the characteristics of the entire watershed must be considered when addressing water quality and water quantity issues, including such factors as the amount of impervious surface and effectiveness of local land management practices. Additionally, the critical influence and impact of water on important ecological and economic systems (such as provision of drinking water, flooding, recreation, and future economic growth) make watersheds increasingly popular and important management and planning units.

Are Watersheds Regulated?

Although there are no regulations associated with a watershed, state and federal agencies look favorably on water-related management and planning processes that utilize the principles and concepts of watershed management.

Watersheds in Tompkins County

The land area within Tompkins County drains into two major river drainage basins: the Oswego River basin, which drains north to Lake Ontario, and the Susquehanna River basin, which drains south to the Chesapeake Bay. Over 383 square miles (245,545 acres) of Tompkins County drain into the Oswego River basin directly or via Cayuga Lake. Over 96 square miles (61,459 acres) of Tompkins County drain into the Susquehanna River. Tompkins County is a major contributor to the Cayuga Lake water system, as the County comprises over half of the total land area in the Cayuga Lake watershed.

Table 2: Watersheds in Tompkins County

Watershed (Common Name)	Acres	Sq. Miles (approx.)	Drainage Basin
Cascadilla Creek	8,664	13.54	Oswego
Catatonk Creek	25,266	39.49	Susquehanna
Cayuga Inlet	58,738	91.81	Oswego
Cayuta Creek	19,303	30.17	Susquehanna
East Cayuga Lakeshore North	9,217	14.41	Oswego
East Cayuga Lakeshore South	13,095	20.47	Oswego
Fall Creek	48,202	75.34	Oswego
Owasco Inlet	21,793	34.06	Oswego
Salmon Creek	21,817	34.10	Oswego
Six Mile Creek	33,403	52.21	Oswego
Taughannock Creek	14,289	22.33	Oswego
West Branch Owego Creek	16,890	26.40	Susquehanna
West Cayuga Lakeshore North	2,794	4.37	Oswego
West Cayuga Lakeshore South	13,533	21.15	Oswego
TOTAL	307,004	479.85	

Source: Tompkins County Planning Department

Map and Data

The following map, developed at a scale of 1:200,000, illustrates 14 watersheds in Tompkins County. Watershed boundary data and areas are available in both paper and digital format from the Tompkins County Planning Department.

Resources and References

Cayuga Lake Watershed Intermunicipal Organization: <http://www.cayugawatershed.org>

Cayuga Lake Watershed Network, P.O. Box 303, 8404 Main St., Interlaken, NY 14847, 607-532-4104.

Dutchess County Department of Planning and the Dutchess County Environmental Management Council. 1985. *Natural Resources*. Dutchess County, NY: Dutchess County Cooperative Extension Association.

EPA, Surf your Watershed: <http://www.epa.gov/surf/>

EPA Watershed Homepage: <http://www.epa.gov/OWOW/watershed/>

NRCS, Hydrologic Unit Boundary Data: <http://www.nrcs.usda.gov/technical/land/meta/m2143.html>

Tompkins County GIS Program, Information Technical Services, 128 East Buffalo Street, Ithaca, NY 14850, 607-274-5418.

<http://www.tompkins-co.org/gis>

Tompkins County Planning Department, 121 East Court Street, Ithaca, NY 14850, 607-274-5560.

AQUIFERS

What is an Aquifer?

Aquifers are geologic formations beneath the Earth's surface that store and yield usable amounts of groundwater. One or more aquifers can lie beneath any given point on the Earth's surface; and the location, size, capacity, depth, and flow characteristics of an aquifer are directly related to the geology and hydrology of the particular aquifer and its recharge area. (See definition of recharge area below.)

Aquifers are usually described as confined or unconfined. Typically, confined aquifers are covered with, or consist of, less permeable substances such as clay or contiguous shale. Unconfined aquifers consist of unconsolidated materials such as sand and gravel, which allow substances to easily percolate from the surface to the aquifers below.

The uppermost boundary of surficial aquifers (those closest to the Earth's surface) is defined by the water table, which is where the spaces in unconsolidated sediments and the openings in bedrock are fully saturated. The spaces between soil and rock particles in the unsaturated zone, located above the water table, are only partially occupied by water. The water table rises and falls depending on the rates of groundwater recharge and discharge and the capacity of the aquifer.

Aquifers can be replenished – or recharged – by the infiltration of precipitation and surface water runoff through soil, as well as by the intermixing of surface water resources such as streams and creeks. The land area that contributes to this infiltration is called a recharge area. Recharge areas may replenish aquifers directly beneath them (as in the case of unconfined or surficial aquifers) or they may recharge aquifers far away (as in the case of confined aquifers).

Why are Aquifers Important?

Aquifers are an important source of water for residential, commercial, and industrial uses. Almost half of all Tompkins County residents rely on groundwater to supply their drinking water needs. Additionally, in central New York, groundwater typically contributes more than half of the total annual flow to local streams and creeks.

Because aquifers are replenished by the infiltration of surface water, impervious surfaces (pavement from roads or parking lots, roofs, building footprints, etc.) decrease recharge areas and threaten aquifers by inhibiting infiltration of precipitation and surface water through the soil. Any contaminant contained in or near an aquifer, and/or its recharge area may potentially contaminate the aquifer. Potential contaminants include bacteria and pathogens leaching from septic systems; gas, salt and oil washed from parking lots; fertilizers; pesticides; hazardous or toxic waste spills; and petroleum or oil leaking from underground storage tanks.

Unlike surface water, which flushes contaminants downstream relatively quickly, groundwater in aquifers migrates relatively slowly and can take several years or decades to move from the point of origin to the point of discharge. Once degraded, an aquifer can become unusable, and oftentimes remediation is not technologically or economically feasible. Moreover, because of groundwater and surface water interactions, contamination in an aquifer may eventually contaminate surface water as well.

The quantity of water contained within an aquifer, and the aquifer's ability to serve as a reliable supply of water, must also be considered. Generally, an aquifer's geology, retention, and

recharge characteristics determine the quantity of water available. When water is withdrawn at a rate faster than it is recharged, the aquifer can be depleted. Generally, this occurs when too many wells withdraw water from an aquifer.

Aquifers in Tompkins County

The process of glaciation and the subsequent deposition of coarse sand and gravel deposits heavily influenced the location, size, and capacity of aquifers in Tompkins County. As a result, several small discontinuous local aquifers in Tompkins County were created that support limited numbers of wells while others supply vast quantities of water. The main aquifers in Tompkins County are located in the major valleys that are comprised of sand and gravel, such as the Cayuga Inlet valley, upper portions of the Six Mile Creek valley, and portions of the Fall Creek valley. Bedrock aquifers (interlayered sandstones, siltstones, and limestones) typically yield much less water than sand and gravel aquifers. Although bedrock aquifers may be sufficient to supply individual residential units and small farms, the water may be heavily mineralized and relatively unreliable.

Maps and Data

The following surficial aquifer map, developed at a scale of 1:24,000, indicates the general location of large unconsolidated aquifers in Tompkins County. This map is not intended to be used for detailed site evaluations, as the determination of precise aquifer locations and characteristics requires additional evaluation. To construct this map, the U.S. Geological Survey (USGS) inventoried well data and well-boring logs to identify the extent, depth, and material characteristics of the surficial aquifers in the County.

To get a copy of a digital file or a paper map of the surficial aquifers in Tompkins County, contact the Tompkins County Planning Department or the local USGS Office.

Resources and References

Miller, Todd S. *Sand and Gravel Aquifers of Schuyler County, New York*. 1990. U.S. Department of Energy, USGS, Water-Resources Investig. Report 90-4073.

Tompkins County Planning Department, 121 E. Court Street, Ithaca, NY 14850, 607-274-5560.

U.S. Geological Survey (USGS), 30 Brown Road, Ithaca, New York 14850, 607-266-0217.

Winter, T.C., J.W. Harvey, O.L. Franke and W.M. Malley. 1998. *Ground Water and Surface Water: A Single Resource*.
USGS Circular.

WETLANDS

What is a Wetland?

Wetlands, according to the United States Army Corps of Engineers (Army Corps), are “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, wet meadows, and similar areas.” According to the New York State Department of Environmental Conservation (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 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.

Why are Wetlands Important?

Wetlands are a critical component of natural ecosystems and provide a variety of benefits such as:

- filtering harmful toxins, nutrients, and sediment from surface and stormwater runoff;
- storing floodwaters and reducing the magnitude of flood events; and
- providing valuable habitat for a diverse array of flora and fauna, including many rare, threatened, or endangered species.

The recreational uses associated with wetlands are also very diverse and include birdwatching, hunting, and fishing, all of which provide direct economic benefits to local communities. Because wetlands are crucially important both economically and environmentally, they are highly regulated by the Army Corps and the DEC.

How are Wetlands Regulated?

The National Wetlands Inventory was developed by analyzing aerial photographs and can be used to locate wetlands that are at least one acre in size, however, locations of wetlands should be verified by the Army Corps.

Additionally, the Army Corps issues wetland permits for the placement of fill or dredge materials and the construction of certain structures in waterways (navigable and non-navigable) and wetlands. Disturbances to wetlands must be mitigated in accordance with Army Corps regulations. The Army Corps permit required for activities within a wetland, and the amount of wetlands mitigation required, vary depending on the type of project proposed and the area of wetland impacted.

The DEC regulates wetlands that are 12.4 acres or larger in size (this is based on the metric system: 12.4 acres = 5 hectares). For any work occurring within a wetland or within 100 feet of a wetland boundary, the DEC requires that a wetlands permit be obtained.

Prior to conducting work in or near a wetland, the Region 7 Office of the DEC or the Army Corps Buffalo District should be contacted to obtain the necessary approvals and permits. Each of these agencies will automatically forward permit applications to the other, and each agency will contact the applicant if additional permits and/or paperwork are needed. If permits are not obtained or wetlands are improperly altered, the Army Corps and the DEC have the authority to levy fines.

How are Wetlands Classified?

The DEC classifies wetlands according to their respective functions, values, and benefits. Of the four classes of wetlands, Class I wetlands are the most valuable and are subject to the most stringent standards. The Army Corps classifies wetlands only according to their species composition.

Wetlands in Tompkins County

Tompkins County contains both NYS DEC Freshwater Wetlands (as determined by the DEC) and National Wetlands (as determined by the U.S. Fish and Wildlife Service) as shown in the following tables:

Table 3: Wetlands in Tompkins County

Municipality	Acres of NYS DEC Freshwater Wetlands	Percent of Municipal Land	Acres of National Wetlands	Percent of Municipal Land
City of Ithaca	27.295	0.70	470.11	12.08
Town of Caroline	554.890	1.57	1,020.92	2.90
Town of Danby	935.900	2.71	1,186.73	3.44
Town of Dryden	2,102.970	3.49	3,401.03	5.93
Town of Enfield	162.347	0.69	694.56	2.94
Town of Groton	728.168	2.30	1,486.83	4.79
Town of Ithaca	75.948	0.39	1,129.57	5.83
Town of Lansing	596.263	1.33	6,840.56	15.50
Town of Newfield	230.466	0.61	526.68	1.39
Town of Ulysses	75.267	0.32	3,046.19	13.01
Vil. of Cayuga Hgts	0.000	0.00	62.66	5.59
Village of Dryden	39.830	3.83	111.92	10.77
Village of Freeville	43.850	6.28	22.98	3.29
Village of Groton	39.420	3.70	101.03	9.49
Village of Lansing	18.850	0.65	30.25	1.04
Vil. of Trumansburg	0.000	0.00	0.05	0.00
Total Tompkins Co.	5,631.464	1.75	19,803.18	6.78

Source: Tompkins County Planning Department, based on USFWS data

NOTE: The NYS DEC Freshwater Wetlands and the National Wetlands Inventory data above includes Cayuga Lake in the total number of municipal acres listed and is factored into the calculation for “Percent of Municipal Land”.

Maps and Data

The following NYS DEC Freshwater Wetlands and National Wetlands Inventory maps were developed at a scale of 1:24,000 and indicate the general location of wetlands in Tompkins County.

Although the Army Corps and the DEC create and periodically update wetlands maps, these maps are developed for use at a scale of 1:200,000 and are best used as an indicator that wetlands are present, and that an on-ground, site-specific investigation by a qualified wetland specialist (Army Corps Engineer or private consultant) is warranted. Many wetlands do not appear on wetland maps, so if land appears to be wet, or has typical wetland plants or soils, landowners should call the Army Corps or the DEC prior to altering the land to avoid wetland destruction and possible fines.

For digital and paper copies of federal and state wetlands, contact the Tompkins County Planning Department or the U.S. Army Corps of Engineers. For information about the origin of the wetlands data (metadata), contact the Cornell University Geospatial Information Repository (CUGIR).

For questions about wetlands on active farmlands or the Wetlands Reserve Program (which makes payment to landowners for establishing wetland easements on their agricultural property), contact the USDA Natural Resources Conservation Service, Ithaca Office.

Resources and References

Cornell University Geospatial Information Repository (CUGIR) <http://cugir.mannlib.cornell.edu/>

Mitsch, W.J. and J.G. Gosselink. 1986. *Wetlands*. New York: Van Nostrand Reinhold

New York State Department of Environmental Conservation <http://www.dec.state.ny.us/index.html>

New York State Department of Environmental Conservation, Region 7 Office, 615 Erie Blvd. West, Syracuse, NY 13204-2400, 315-426-7403.

Tompkins County Planning Department, 121 East Court Street, Ithaca, NY 14850, 607-274-5560.

U.S. Army Corps of Engineers: <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/techbio.htm>

U.S. Army Corps of Engineers, Buffalo District, Regulatory Branch, 1776 Niagara Street, Buffalo, NY 14207, 716-879-4330

NYS Department of Environmental Conservation, Division of Environmental Permits, P.O. Box 1285, Fisher Avenue, Cortland, NY 13045-1090, 607-753-3095: <http://www.lrb.usace.army.mil>

U.S. Fish and Wildlife Service, Division of Habitat Conservation, National Wetlands Inventory:
<http://www.nwi.fws.gov/>

USDA Natural Resources Conservation Service (NRCS), Ithaca Office, 903 Hanshaw Rd., Ithaca, NY 14850, 607-257-3820.

USDA / NRCS, Wetlands Reserve Program: <http://www.nrcs.usda.gov/programs/wrp/> and Wetland Science Institute:
<http://www.pwrc.usgs.gov/WLI/>

FLOOD HAZARD AREAS

What are Flood Hazard Areas?

Flood Hazard Areas (FHA) are areas that the Federal Emergency Management Association (FEMA) has determined to be vulnerable to flooding (see table on next page for a description of flood event frequencies).

Why are Flood Hazard Areas Important?

Flood events are part of natural hydrological and seasonal cycles. The size and location of the areas which are typically inundated during flood events, as well as the magnitude of the event, are significantly influenced by the total area of impervious surface (roads, parking lots, etc.) and wetlands within a watershed. Creation of, or increases in, impervious surfaces, diversion of water off the landscape (to ditches or nearby water bodies), and the loss of wetlands which help store and control floodwaters also cause higher volumes and peak flows of stormwater runoff. It should also be noted that, while floods can cause damage to the infrastructure, the economy, and the environment, periodic inundation can benefit the habitat of certain flora and fauna species and add nutrients to agricultural lands located in flood areas.

Flood Hazard Areas in Tompkins County

FEMA produces paper Flood Insurance Rate Maps (FIRMs) to show areas subject to flooding as determined by historic, meteorological, and hydrological data, as well as open space conditions, flood control structures, and land use in the watershed at the time the FEMA study is conducted. These maps delineate Special Flood Hazard Areas, commonly referred to as 100-year or base flood areas. These maps may also include the elevation of the base flood (100-year flood event), flood insurance risk zones, and areas subject to inundation by a 500-year flood event, all of which may be used to establish the National Flood Insurance Program's (NFIP) flood insurance premiums.

FIRMs exist for every municipality in Tompkins County, with two exceptions: the Town of Enfield and the Village of Cayuga Heights. (The Village of Cayuga Heights has been certified by FEMA as having no SFHAs; and the Town of Enfield does not participate in NFIP.) In all other municipalities, 100-year flood zones have been identified and mapped. Additionally, base flood elevations are recorded for the Village of Groton, the Village of Dryden, the Town of Ithaca, the City of Ithaca and along Cayuga Lake in the Town of Lansing, the Village of Lansing, and the Town of Ulysses. FIRMs may also identify floodways, which are defined as water body channels plus any adjacent floodplain areas that must be kept free of encroachments so that the 100-year flood discharge can be conveyed without increasing the elevation of the 100-year flood more than a specified amount. Floodways are mapped in the City of Ithaca, the Village of Dryden, and the Village of Groton.

Maps and Data

FEMA has created a digital version of the FIRMs, called Q3 Flood Data, to be used for post-disaster response and recovery, as well as general planning purposes. This digital data displays 500-year flood zones, 100-year flood zones, and areas outside these flood zones for all such areas defined on the paper FIRMS.

Q3 Flood Data differs from the paper FIRMs in that the Q3 Flood Data does not include base flood elevation information necessary for engineering analysis and site design. FEMA also notes that Q3 Flood Data should not be used to identify the flood-prone status of a property within 250 feet of a Special Flood Hazard Area, nor should it be used for site design, engineering, or flood

insurance policy rating for properties in a Special Flood Hazard Area. All site specific information should be taken from the paper FIRMs.

The measurement used to estimate the frequency of a flood event can be confusing because a 100-year flood event is not a flood event that is likely to occur once every 100 years. Rather, it has a one percent chance of occurring or being exceeded during a one-year period, a 10% of occurring during a 10-year period, an 18% chance of occurring in a 20-year period, and so on. The following table shows the likelihood of occurrence of flood events during specified intervals of time.

Table 4: Likelihood of Experiencing at Least One Flood Event

Flood Event							
	<i>In 1 year</i>	<i>In 10 years</i>	<i>In 20 years</i>	<i>In 25 years</i>	<i>In 30 years</i>	<i>In 50 years</i>	<i>In 100 years</i>
10-year	10%	65%	88%	93%	96%	99%	99.99%
25-year	4%	34%	56%	64%	71%	87%	98%
50-year	2%	18%	33%	40%	45%	64%	87%
100-year	1%	10%	18%	22%	26%	39%	63%
500-year	0.2%	2%	4%	5%	6%	10%	18%

Source: *Water Courses* Vol. 5, Issue 1, Spring 1998. A Newsletter from Cornell Cooperative Extension and the Department of Soil, Crop and Atmospheric Sciences, Cornell University

Finally, it is important to note that many FIRMs for Tompkins County are outdated because development occurring in floodplains has altered flood hazard areas over time. Until FEMA updates the maps, planners and landowners should be aware that areas that will actually flood might vary significantly from the mapped FHAs.

To order official FIRMs or Q3 Flood Data, contact FEMA’s Map Service Center. You can also view the FIRM maps or get Q3 Flood Data area maps at the Tompkins County Planning Department.

Resources and References

FEMA’s Map Service Center: <http://www.fema.gov/maps.shtm>

FEMA’s Map Service Center, P.O. Box 1038, Jessup, MD 20794-1038, Tel: 800-358-9616, Fax: 800-358-9620. Information and an Adobe Acrobat order form is available at <http://www.fema.gov/help/index.shtm#pdf>

FEMA’s National Flood Insurance Program: <http://www.fema.gov/nfip/>

FEMA's Q3 Flood Data Users Guide is available at http://www.fema.gov/fhm/fq_q3.shtm

Tompkins County Planning Department, 121 East Court Street, Ithaca, NY 14850, 607-274-5560.