



# Tomhannock Reservoir Watershed Protection Study Update

Capital District Regional Planning Commission



# About CDRPC

The Capital District Regional Planning Commission (CDRPC) provides objective analysis of data, trends, opportunities and challenges relevant to the Region's economic development and planning communities. CDRPC serves the best interests of the public and private sectors by promoting intergovernmental cooperation; communicating, collaborating, and facilitating regional initiatives; and sharing information and fostering dialog on solutions to regional problems.



CAPITAL DISTRICT  
**Regional  
Planning  
Commission**

# About DWSP2

The Drinking Water Source Protection Program (DWSP2) is a state-run program created to assist municipalities with proactively protecting their drinking water sources. The goal is to help municipalities develop and implement their own unique drinking water source protection plan for the source(s) of their drinking water.

DWSP2 is a four Agency initiative co-led by DEC and Department of Health, in collaboration with the Department of Agriculture and Markets (DAM) and Department of State. As a result of this voluntary program, participating municipalities can use their newly developed drinking water source protection plan to start implementing protection measures.



# How Does DWSP2 Benefit My Community?

The purpose of developing a long-term protection plan for source water(s) is to protect public health and safety, and the environment. Using a drinking water source protection plan, municipalities can make informed decisions to achieve source water protection.

- Protect public health by preventing pollutants from entering a drinking water supply.
- Avoid preventable drinking water treatment costs.
- Increase community confidence in their local public drinking water.
- Create long-lasting partnerships that support implementation.
- Utilize a broad array of existing funding sources to aid with project implementation costs.



# How is this work Funded?

Funding for this report has been provided by a grant from the New York State Department of Environmental Conservation (NYSDEC) originating from a federal allocation from the Environmental Protection Agency (EPA) under Section 604(b) of the National Water Quality Act.



# Reservoir Overview

- Owned by city of Troy
- Elevation: 391 feet
- Area: 1,720 acres
- Shoreline Length: 19 miles
- Length: 5.2 miles
- Average Depth: 23 feet
- Watershed includes parts of five towns: Brunswick, Grafton, Hoosick, Pittstown, and Schaghticoke.
- Serves 135,000 people including Troy, Rensselaer, Menands, East Greenbush, North Greenbush, Brunswick, Schaghticoke, Waterford, Halfmoon and Poestenkill



# Reservoir Overview (cont.)

Total Permitted Water Withdrawal Capacity of 32 MGD

Draw daily average of 32 MGD

Fed by three tributaries: Otter, Sunkauissia, and Indian Creeks

Tomhannock Reservoir intake features 10 screens in 2 vaults, depth of 50 ft

In 2019, water customers within the city of Troy were charged \$3.43 per 1,000 gallons of water

5-year annual average revenue is ~\$11.5m

For 2021 the budgeted expenditures are ~\$9m (not including costs associated with distribution or garage expenses)



# NYSDOH Source Water Assessment for the Tomhannock Reservoir.

- The assessment found an elevated susceptibility to contamination. The amount of agricultural land in the assessment area results in an elevated potential for protozoa and pesticides contamination.
- Noteworthy contamination susceptibility associated with other discrete contaminant sources, and these facility types include mines and closed landfills.
- Hydrologic characteristics (e.g. basin shape and flushing rates) generally make reservoirs highly sensitive to existing and new sources of phosphorus and microbial contamination.

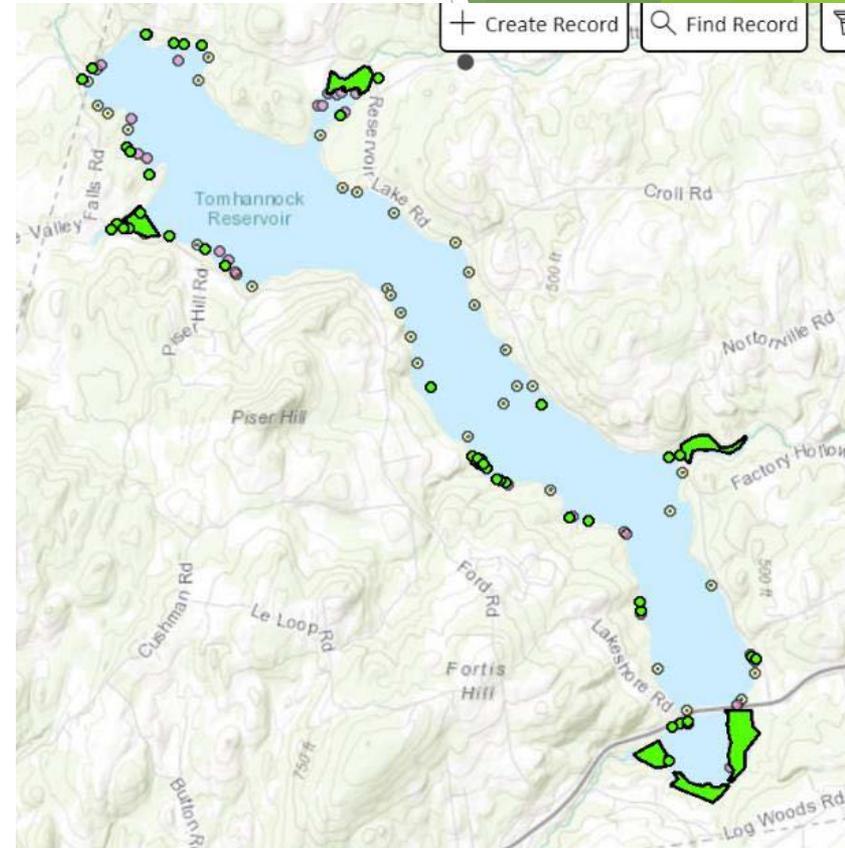
# Specific Reservoir Water Quality Issues Identified in the 1995 Report

- Activities in the watershed which result in excessive soil erosion (such as during construction, loss of farmland, and the location of residences on sites poorly suited for development)
- Periodic levels of algal activity and turbidity
- Threat of nutrient penetrations associated with failed septic systems and barnyard practices
- Lack of Development oversight and comprehensive planning



# Specific Reservoir Water Quality Issues Identified for Study Update

- Six major Water Chestnut infestations, ~72 acres
- Activities in the watershed which result in excessive soil erosion
- Lack of administrative and enforcement ability for land use, permitting, subdivision and site plan review
- Illegal trash and dumping



Town	1990 Watershed Population	2000 Watershed Population	2010 Watershed Population	Net Population Change 1990 - 2010	Percent Population	2020 Watershed Population (estimate)	Net Population Change 2010 - 2020	Percent Population
					Change 1990 - 2010			Change 2010 - 2020
Brunswick	11,093	11,664	11,941	848	7%	12,143	202	2%
Grafton	1,917	1,987	2,130	213	10%	2,159	29	1%
Hoosick	6,696	6,759	6,924	228	3%	6,979	55	1%
Pittstown	5,468	5,644	5,735	267	5%	5,827	92	2%
Schaghticoke	7,574	7,456	7,679	105	1%	7,803	124	2%
<b>Total</b>	32,748	33,510	34,409	1,661	5%	34,911	502	1%

# Study Update Objectives

- CDRPC will develop and implement a Drinking Water Source Protection Program (DWSP2) using the DWSP2 Framework.
- Protect public health by preventing pollutants from entering a drinking water supply.
- Avoid preventable drinking water treatment costs.
- Increase community confidence in their local public drinking water.
- Create long-lasting partnerships that support implementation.



**Acute** conditions are severe and sudden in onset. This could describe anything from a broken bone to an asthma attack. A **chronic** condition, by contrast is a long-developing syndrome, such as heart disease or diabetes.

Water Chestnuts are an **Acute** condition, a critical issue that necessitates an immediate intervention such as harvesting or chemical treatment.

Pollution, from nutrients, sediment and contaminants is a **chronic** concern – one that requires changes in land use policy, pollution controls and engineered solutions.

Addressing the **Acute** conditions without the **Chronic** conditions does not adequately provide a long-term solution the problems at the reservoir.



# Study Update Timeline

- **January**
  - Kick off Stakeholder Group
  - Develop Goals and Vision
  - Begin Data Collection
  - Complete Maps
- **February**
  - Complete review of prior study objectives and performance measures
  - Stakeholder interviews
- **March**
  - Begin Code Audits, Draft protection strategies and programs
- **April**
  - Complete Code Audits, Second round of Stakeholder interviews Complete protection strategies and programs
- **May**
  - Review Draft Report and code recommendations
  - Develop an implementation timeline and designate a plan management team using the DWSP2 Framework to keep the protection program on track.



# **Task 1: Assemble a Stakeholder Group**

## **Select municipalities and institutions within Watershed**

- City of Troy
- Town of Brunswick
- Town of Pittstown
- Village of Schaghticoke
- Town of Hoosick
- Rensselaer County Planning and Economic Development
- Rensselaer County Soil and Water

## **Agencies and Organizations**

- NYS Farm Bureau
- Hudson River Watershed Alliance
- NEWIPC, DEC
- Rensselaer Land Trust
- Rensselaer Plateau Alliance
- Rensselaer County Health Department
- Rensselaer County Soil and Water Conservation District



# Question for Stakeholders

- What individuals or organizations are critical to the success of this initiative and not represented?
- What concerns do you or your organization have for this resource?
- What resources does your organization have to offer this study effort?
- How can partnerships be strengthened between the resource owner, communities surrounding the reservoir, advocacy organizations, landowners and businesses?



**Task 2:** Establish goals and formulate a vision.

Work with the stakeholder group to establish goals and formulate a vision to guide development and implementation of the protection program. Collect any relevant source water assessment and protection information needed for the selected community.



# *Model Plan Goals*

- Increase stream buffers, working with willing landowners to purchase easements through grants or restrict encroachment
- Identify and address sources of pollutants of concern
- Focus development and minimize impacts, limit potential for harm to waterbodies feeding the reservoir
- Identify and address causes of nutrient loading and turbidity
- Purchase or protect land of significant environmental protection value to the reservoir with the aid of willing landowners
- Remove invasives and work to ensure they do not return
- Ensure, if recreational access around or in the reservoir is allowed, that water quality is not impaired as a result



# Questions for Stakeholders

- Do these goals remain relevant?
- Are these goals sufficient?
- Are any goals missing?
- Are any goals too lofty?
- How is success measured for this project?
- In what ways can this study yield measurable results?

# MODEL Vision

*“Through a comprehensive analysis of threats - existing and potential - to the Reservoir, and the development of potential solutions, policies, and regulatory guidelines that can mitigate these threats, this program will enable, encourage and support municipal and third party efforts within the watershed to protect this valuable resource and ensure the the reservoir remains a quality drinking water source.”*



# Questions

- Does this vision sufficiently summarize the goals and desired outcomes?
- Does this vision inspire involvement from stakeholders?
- What concerns do you or your organization have for this resource?



# 1995 Report Findings



In 1995 land use regulations had not been extensively used in the watershed communities to protect the water resources and quality of the streams and lakes in this area:

- Of the five municipalities within the watershed, three had enacted a zoning ordinance to provide guidance to future development patterns.
- All of the watershed communities had adopted subdivision regulations, most with general considerations for stormwater runoff and vague erosion considerations.
- The Town of Pittstown was the only watershed community that prohibits development within 100 feet of a stream or water body.

- The Town of Schaghticoke was the only watershed community to directly regulate timber harvesting and to allow residential cluster development.
- None of the watershed communities required the submission of an erosion and sediment control plan.
- Both State Public Health Law and NYS DEC have provisions regulating selected activities within a roughly 50 foot distance of nearly all of the streams within the watershed.
- The Public Health Law and NYS DEC provisions have not always been comprehensively enforced within the region and the watershed communities generally have not reinforced these provisions as part of their zoning ordinances.

# 1995 Report Recommendations



# 1. PROTECT SENSITIVE ENVIRONMENTAL AREAS:

- Prevent development from occurring in floodplains, wetlands, steep slopes, mature forests, critical habitat areas, and along stream banks ( conservation subdivisions, “design with nature”)
- On site septic systems should not be allowed on soils that can't adequately filter septic effluent.
- The County Conservation District should continue to provide technical support, promote, and seek cost-sharing measures to install additional conservation measures



## 2. ESTABLISH STREAM and WETLAND BUFFERS:

Establish vegetative buffers adjacent to the stream channels and large unregulated wetlands (50 - 200 ft.).

Restrict structures and clearing in buffer zones.

A stream buffer overlay zone could be incorporated into the local zoning codes. In cases where no viable use is left for a parcel, the municipality should purchase the land.

### 3. CONTROL EROSION FROM CONSTRUCTION ACTIVITY:

Sediment accumulation and soil movement - erosion - are influenced by the following primary factors:

- soil erodibility
- vegetative cover
- topography
- climate and season

Planning boards should examine these factors by requiring the submission of an erosion and sedimentation plan



## 4. Implement Zoning:

Each watershed community should be conscious of the underlying soil characteristics and constraints within their community and base their allowed zoning density accordingly.

Communities should be aware of the land uses with the potential for contamination and, once identified, these uses should be restricted from aquifer recharge areas and stream corridors and special precautions should be taken for the storage and disposal of their potential contaminants.

## 4. Site Plan Review

Site plan review, in regards to water quality protection, is useful for controlling the location of the structure on the lot so as to avoid sensitive environmental features such as wetlands, flood plains, steep slopes, poor soils, aquifer recharge areas, and stream corridors and to limit the amount of natural vegetation removal. Site plan review can also be the forum for community planning boards to require and review erosion and sediment control and stormwater management plans.



## 4. Subdivision Laws

Subdivision laws are also very useful for mitigating potential water quality impacts. As of 1995, all of the communities within the watershed had enacted subdivision regulations.

Communities that do not currently require the submission of an erosion and sedimentation and/or storm water management plan should consider amending their subdivision regulations to require such plans when it is determined that erosion, sedimentation and/or stormwater runoff from the proposed development will have a significant effect on the environment.

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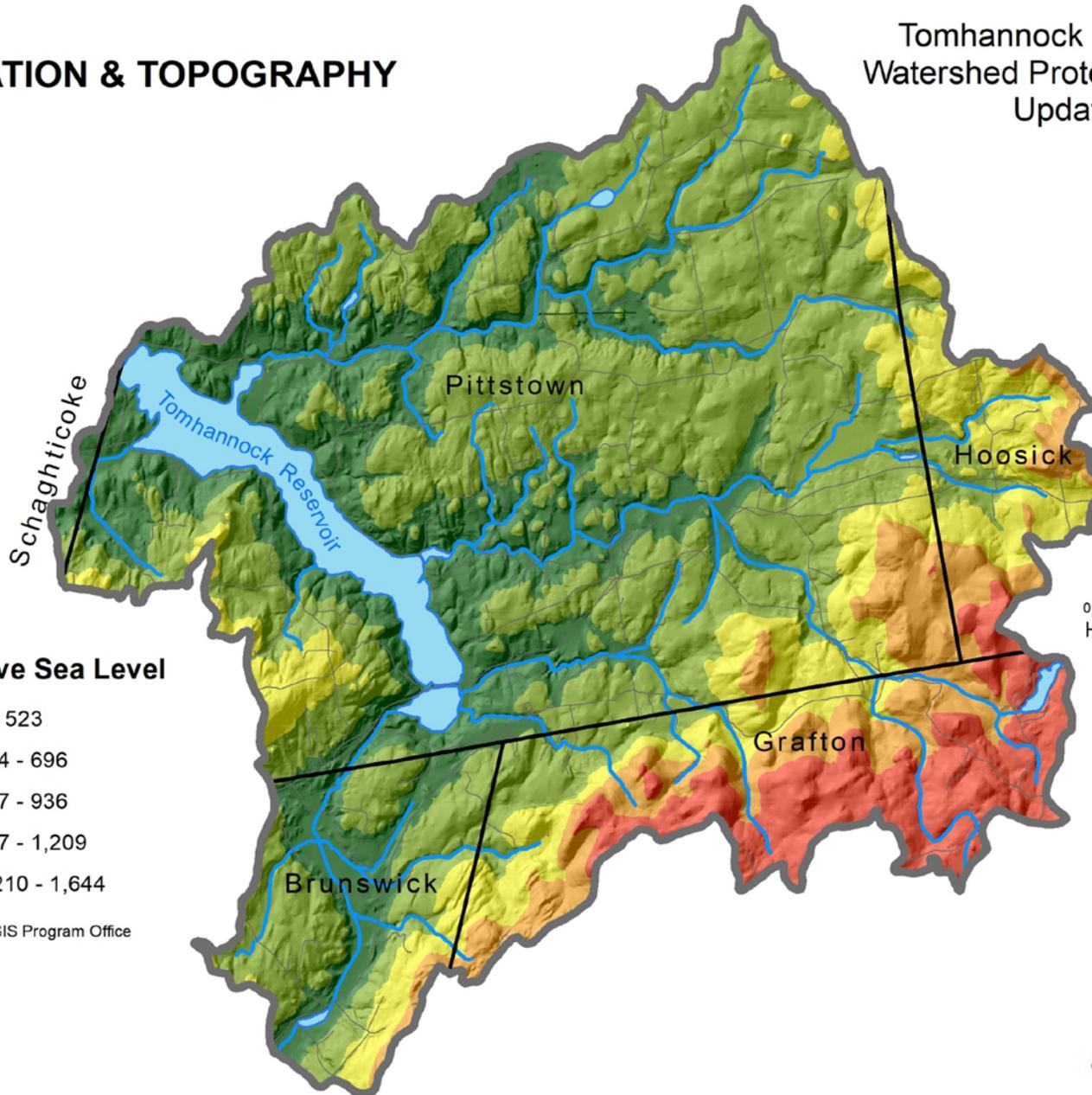
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# Questions for Stakeholders

- Do you believe these recommendations are still valid?
- For those that are still valid, but unaddressed, why haven't they been advanced, and what may be done to modify or encourage the recommendation, so it is adopted?
- What protection strategies not in place today would you like to see proposed?

# ELEVATION & TOPOGRAPHY

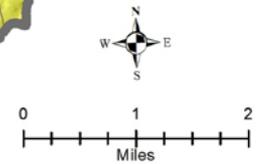
## Tomhannock Reservoir Watershed Protection Study Update



### Meters Above Sea Level

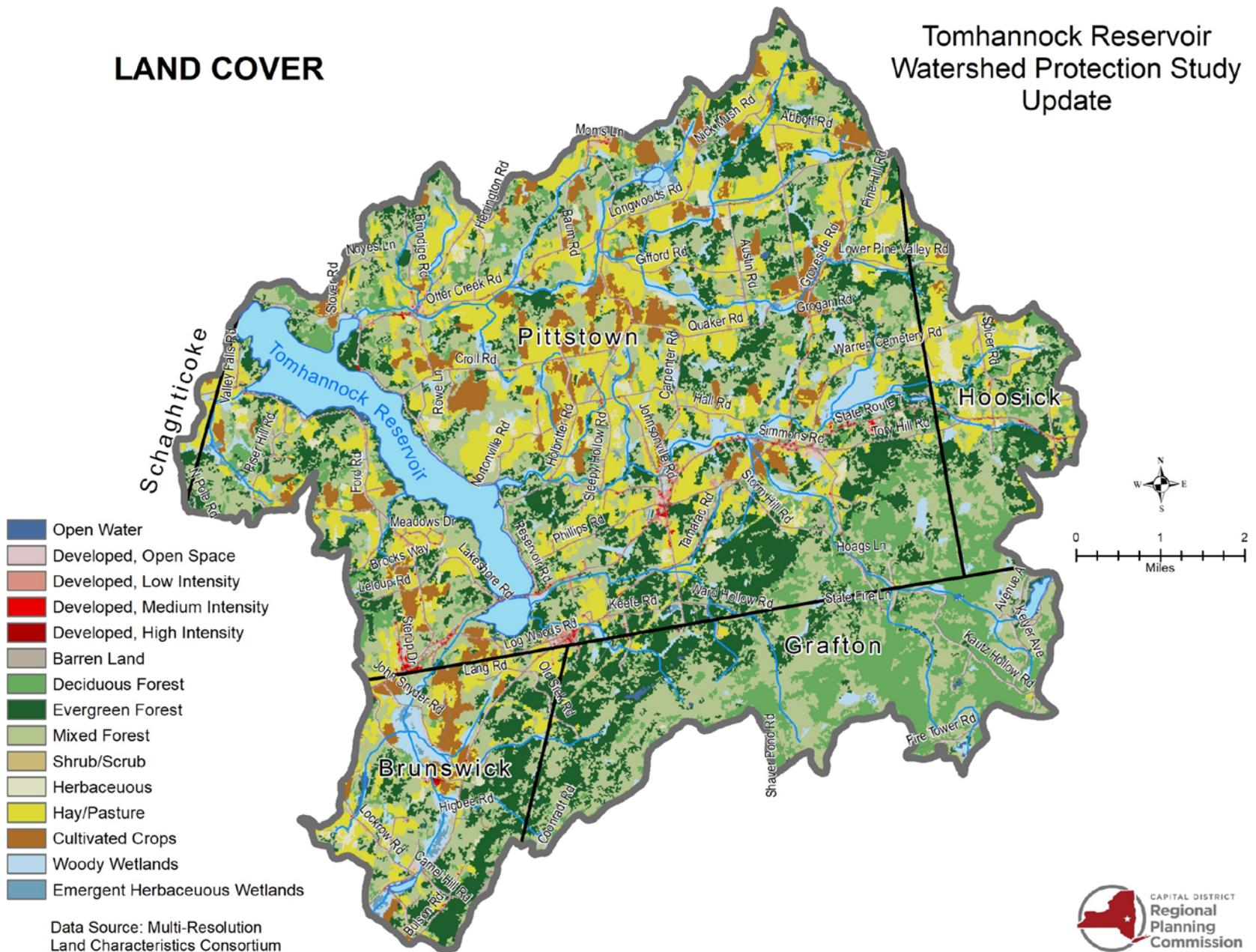
- 7 - 523
- 524 - 696
- 697 - 936
- 937 - 1,209
- 1,210 - 1,644

Data Source: NYS GIS Program Office



# LAND COVER

# Tomhannock Reservoir Watershed Protection Study Update

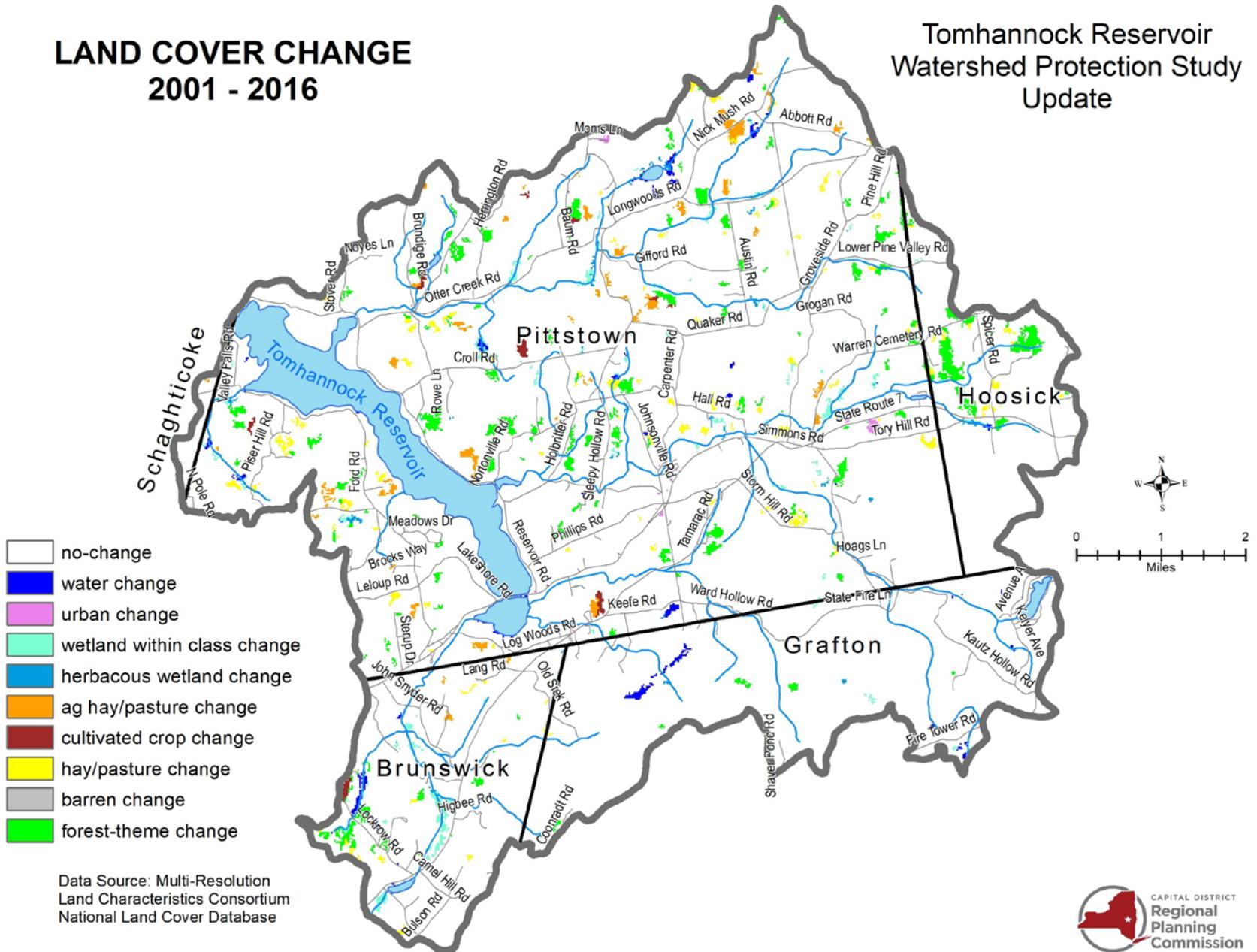


Data Source: Multi-Resolution Land Characteristics Consortium National Land Cover Database



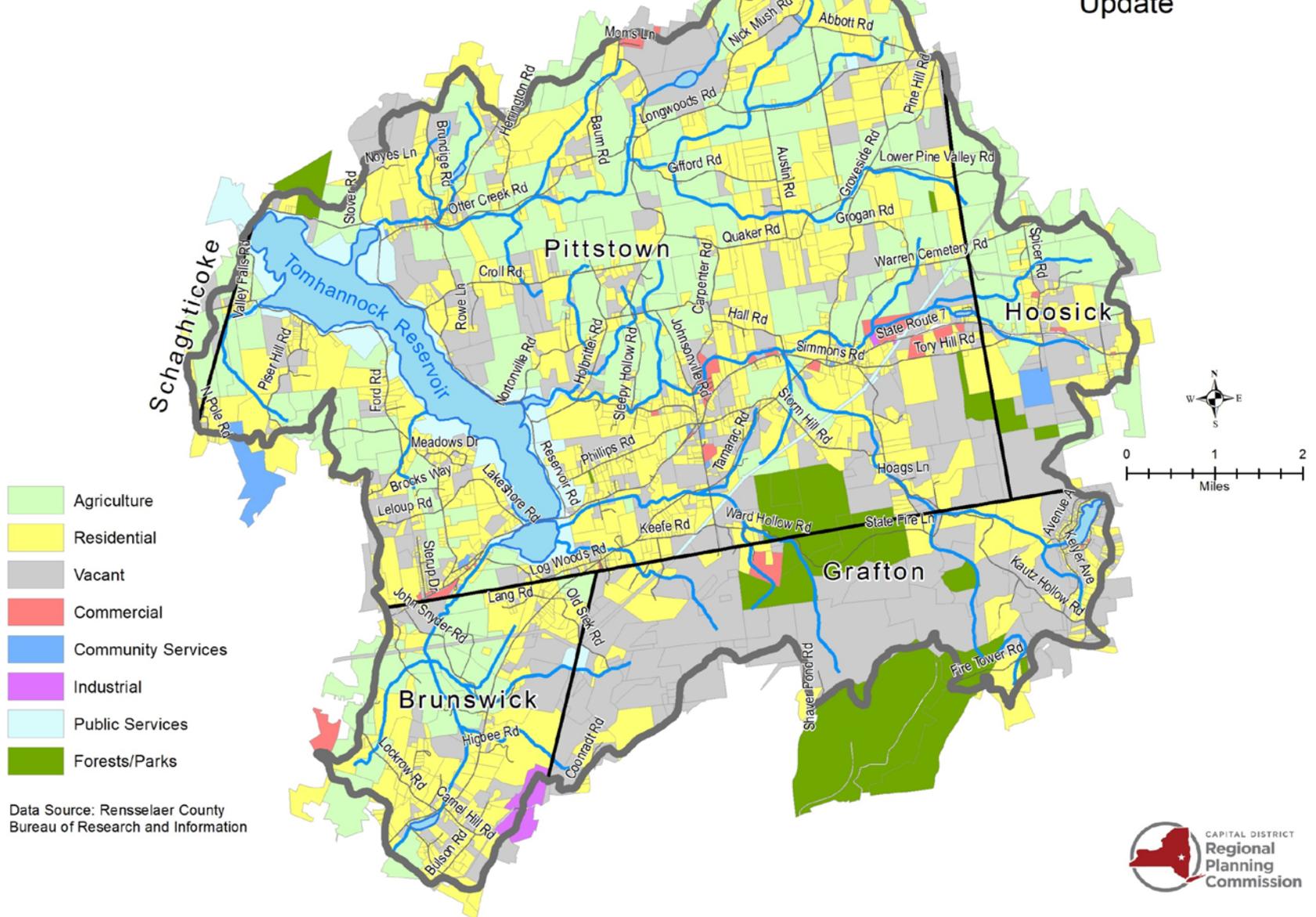
# LAND COVER CHANGE 2001 - 2016

## Tomhannock Reservoir Watershed Protection Study Update



# LAND USE

# Tomhannock Reservoir Watershed Protection Study Update

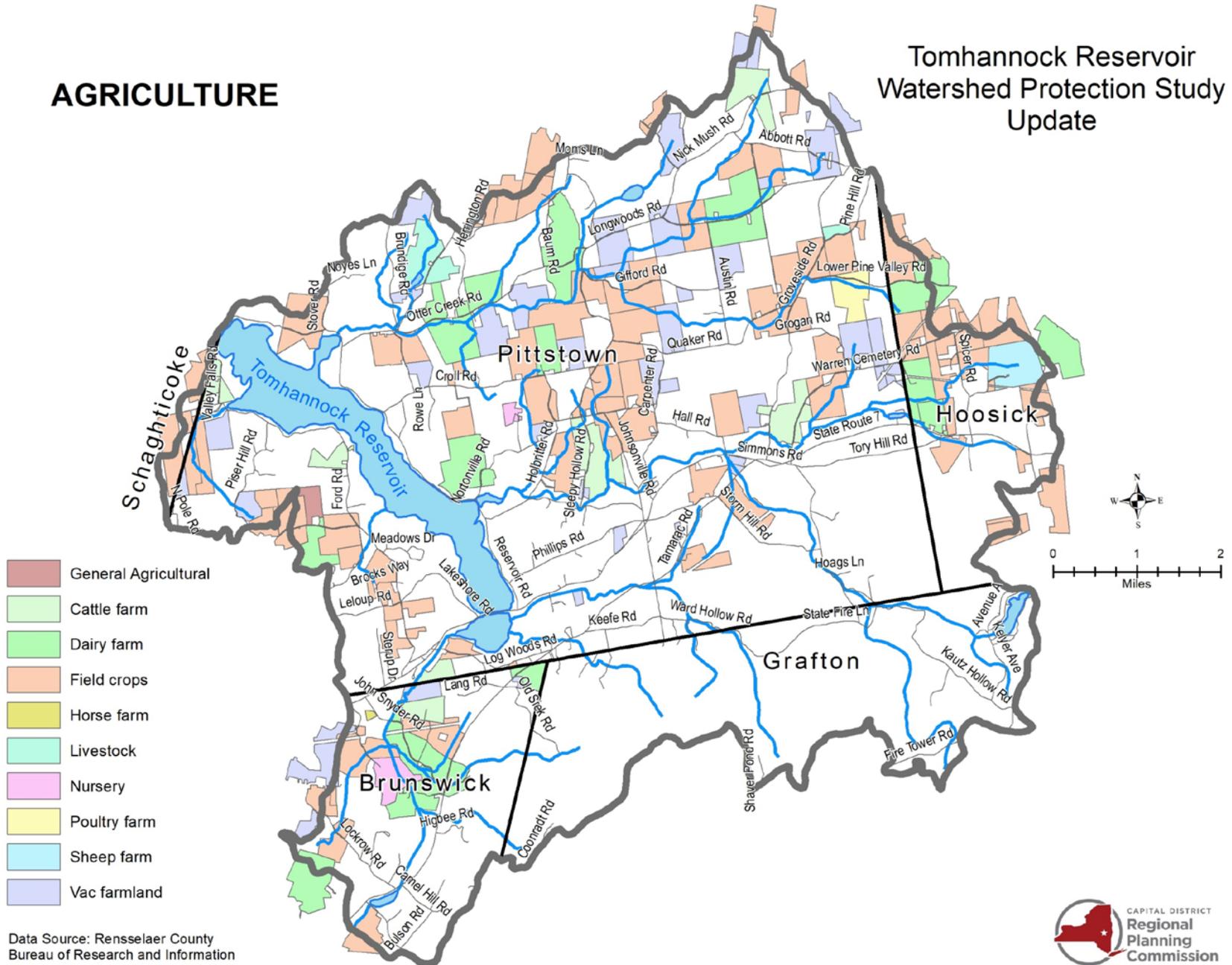


Data Source: Rensselaer County  
Bureau of Research and Information



# AGRICULTURE

## Tomhannock Reservoir Watershed Protection Study Update

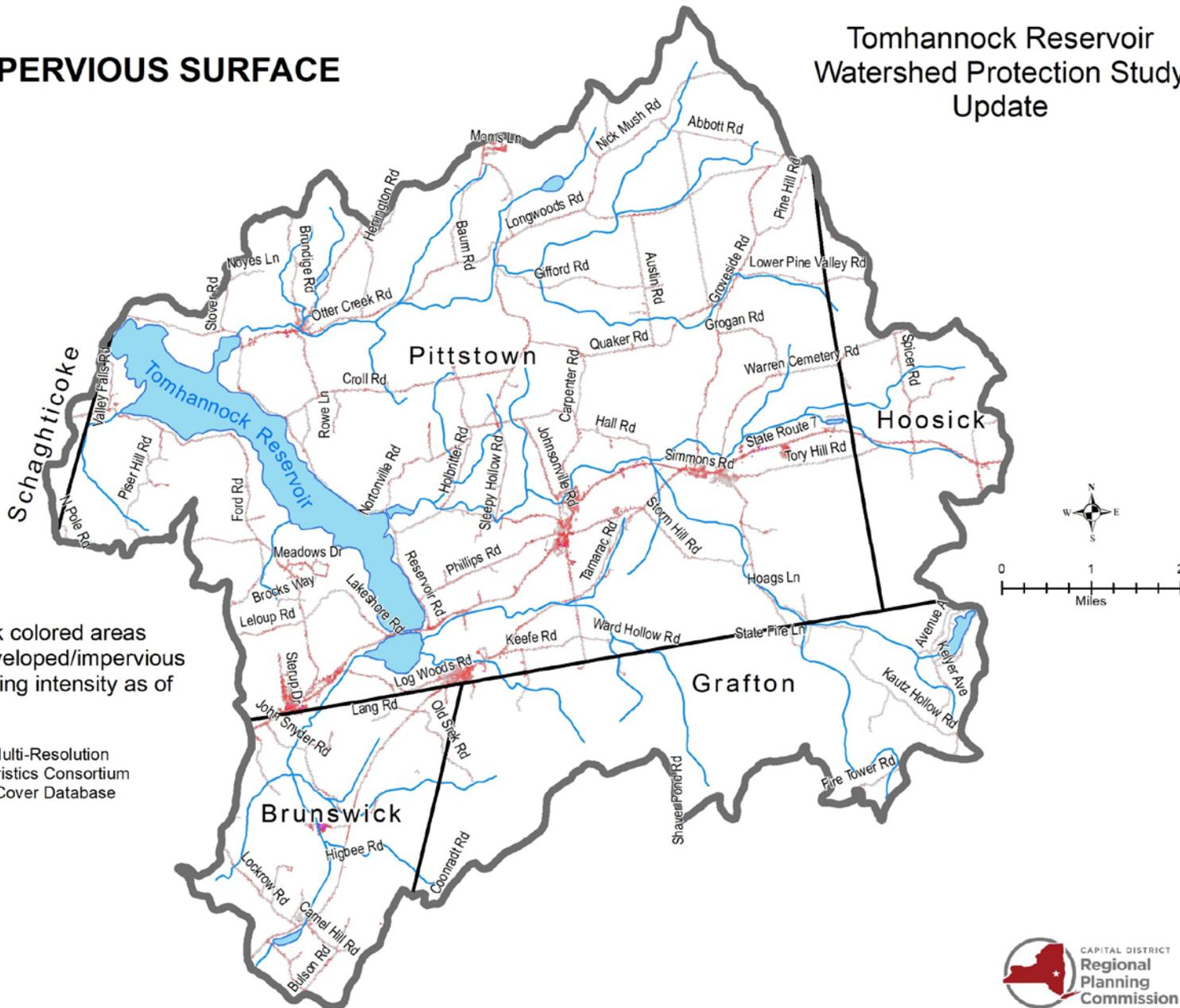


Data Source: Rensselaer County  
Bureau of Research and Information



# IMPERVIOUS SURFACE

## Tomhannock Reservoir Watershed Protection Study Update

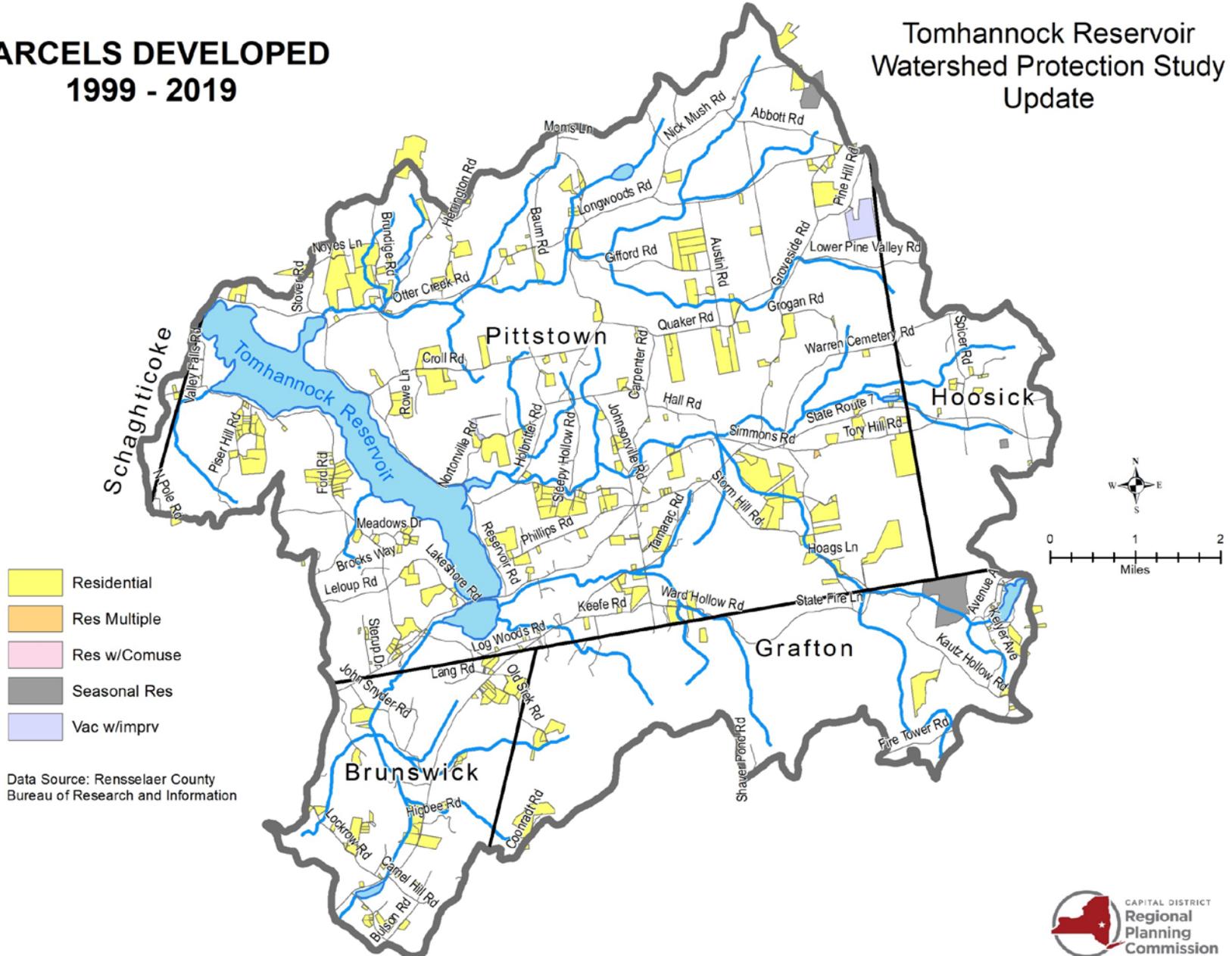


Grey to pink colored areas indicate developed/impervious land of varying intensity as of 2016.

Data Source: Multi-Resolution Land Characteristics Consortium National Land Cover Database

# PARCELS DEVELOPED 1999 - 2019

## Tomhannock Reservoir Watershed Protection Study Update



Data Source: Rensselaer County  
Bureau of Research and Information

# NYS DEC REGULATED SITES

# Tomhannock Reservoir Watershed Protection Study Update







# Questions for Stakeholders

- Do these maps sufficiently communicate the potential threats to the Reservoir?
- Are these maps complete? What data, if any, is missing?

# Questions for Stakeholders

- What strategies, not currently in the place, or in place but are not effective, could be employed to protect water quality?
- How would these new programs or efforts affect your constituents?
- What would make my job easier and more effective in protecting water quality in the watershed?
- What goals does your community or organization have that may be at conflict or benefit water quality in the watershed?



# Next Steps



# Task 3

Use the DWSP2 Framework to update the drinking water source protection map.

- Performance measure:  
Completed map(s) and GIS shapefiles showing delineated source water protection areas and potential contaminant sources (PCS) within the watershed. Provide to DEC with Quarterly report.



# Task 4

Work with community to conduct a PCS inventory and identify protection methods that the community deems appropriate using the DWSP2 Framework and updated maps.

- Performance measure: Completed PCS Inventory table according to the DWSP2 Framework.
- Performance measure: Regulatory and/or non-regulatory protection methods are selected. Provide to DEC with Quarterly report.



# Task 4

Work with community to conduct a PCS inventory and identify protection methods that the community deems appropriate using the DWSP2 Framework and updated maps.

- Performance measure: Completed PCS Inventory table according to the DWSP2 Framework.
- Performance measure: Regulatory and/or non-regulatory protection methods are selected. Provide to DEC with Quarterly report.



# Task 5

Develop an implementation timeline and designate a plan management team using the DWSP2 Framework to keep the protection program on track.

- Performance measure: Implementation timeline table is completed using the table included in the DWSP2 Framework as a model. Provide to DEC with quarterly report
- Performance measure: Identify members of the Plan Management Team. Using the DWSP2 Framework create a list of protection methods and how the measures will be completed (e.g., funding source, parties involved, obstacles and needs, etc.). Provide to DEC with Quarterly report



# Task 6

Once the Drinking Water Source Protection Program (DWSP2) has been finalized, it will be shared with DEC for review.

- Performance measure: The DWSP2 is submitted to DEC for review



# Task 7

Facilitate education and outreach and source water related trainings to elected officials and municipal staff. Potential topics include: importance of source water protection, available resources to develop a DWSP2, and existing protection strategies for sources of drinking water.

- Performance measure: Trainings/Presentations held on importance of source water protection with municipal officials.
- Performance measure: Trainings held with municipal officials regarding protection strategies.



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**Department of Environmental Conservation**