

Niagara River/ Lake Erie WATERSHED ATLAS and BIBLIOGRAPHY

Regional Niagara River Lake Erie Watershed Management Plan – Phase 2

June 2017

During the development of the Niagara River Watershed Management Plan (Phase 1), an impressive collection of existing plans, studies, reports, data, and maps were gathered and reviewed to help establish the overall physical, biological and ecological conditions of the Niagara River Watershed. During this second phase of the study, seven additional sub-watersheds were added comprising the complete Niagara River/ Lake Erie Watershed territory in New York State. Additional resources were identified for the added territory. This Atlas is a full assembly of these resources and the ones collected in Phase 1, providing a comprehensive record of previous watershed efforts utilized in the watershed management planning process.



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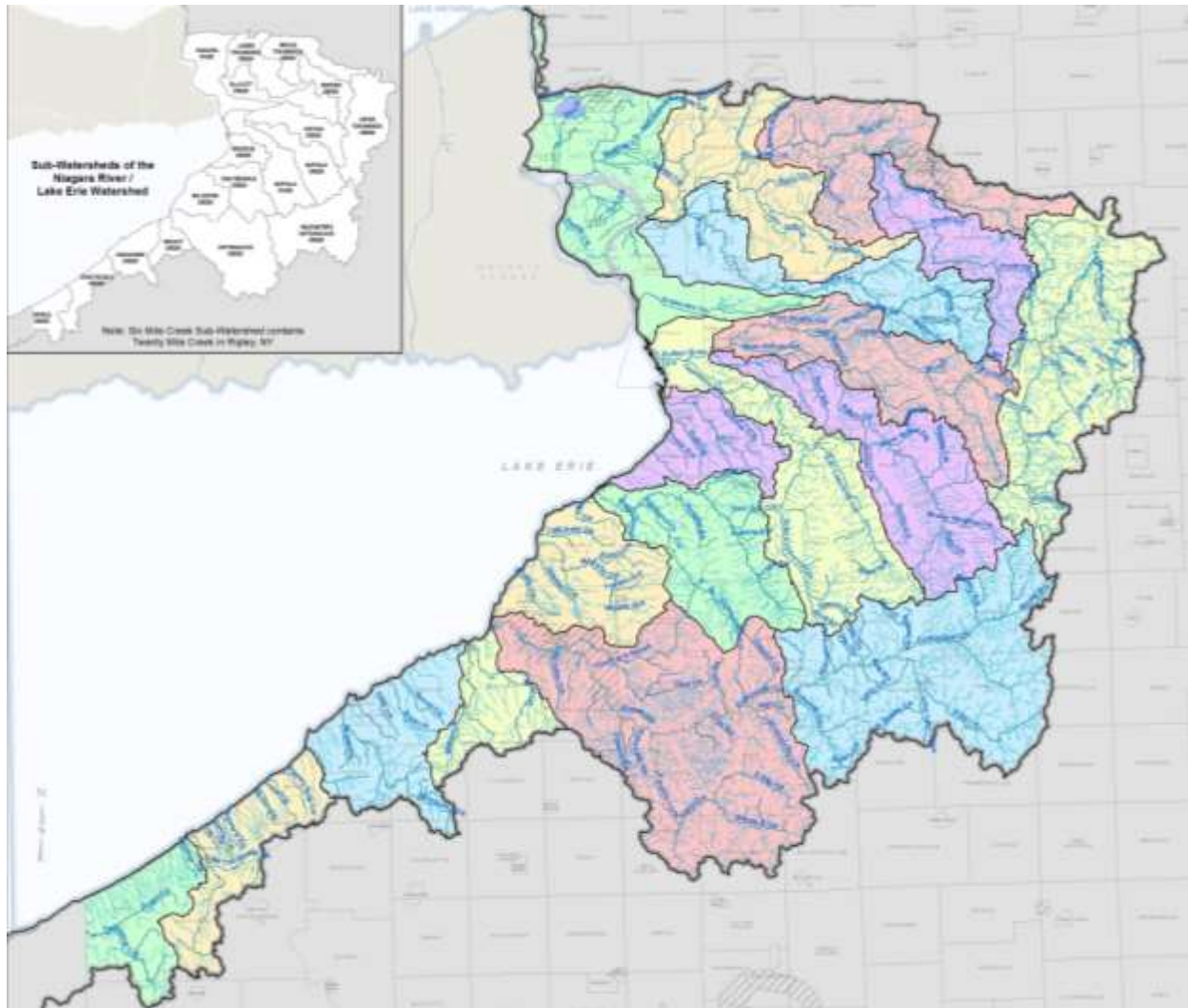
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The opinions, results, findings and/or interpretations of data contained therein are the responsibility of the Contractor and do not necessarily represent the opinions, interpretations or policy of the State. For more information on the Regional Niagara River Lake Erie Watershed Management Plan – Phase 2 project, visit www.erie.gov/wmp. For more information regarding watershed planning in New York State, visit the NYS Department of State's website at, www.dos.ny.gov/opd/programs/waterResourcesMgmt/watershedoverview.html.

Waterways and Sub-Watersheds in the Niagara River / Lake Erie Watershed within New York State



The sub-watersheds in the Niagara River Lake Erie Watershed are based on 10-digit Hydrologic Unit Codes (HUC) determined by the United States Geological Survey (USGS) prior to 2013. The names generally correspond with one of the major waterways within the boundaries. In the case of the Six Mile Creek Sub-watershed, Six Mile Creek is located in Pennsylvania, outside of the scope of work of this project. The Six Mile Creek Sub-watershed includes Twenty Mile Creek in Chautauque County. The Buffalo River sub-watershed includes Cazenovia Creek. In 2013, USGS updated the 10-digit HUC boundaries based on new procedures to better align with procedures used by Canada. Since New York State agencies had not updated their delineations of the boundaries as of 2016, we have also continued with the pre-2013 boundaries in this Atlas, which will also align with Phase 1 of this Project.

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¹ <http://prism.oregonstate.edu>

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GENERAL RESOURCES ON WATERSHED PLANNING

Reports are listed alphabetically by author. Please note that in the few cases where a particular author could not be identified, the reports are listed under their title.

American Planning Association, *Low Impact Development, Zoning Practice*, August 2010

Provides an overview of Low Impact Development (LID) by describing what it is, where it originated, where it is being used, and what the benefits are. Identifies land use and engineering requirements that can inhibit or preclude the use of LID techniques and the strategies that were developed to integrate LID into local codes, standards, and regulations.

<https://www.planning.org/zoningpractice/2010/pdf/aug.pdf>

Bergmann Associates, *Black River Watershed Management Plan: Watershed Characterization, Recommendations, & Implementation*, May 2010

This plan characterizes and assesses the Black River watershed in New York State and was provided as an example of what the Niagara River Watershed Management Plan should look like.

<http://www.tughill.org/wp-content/uploads/2011/10/7BRWFinalDocumentPartI-May2010.pdf>

Bergmann Associates, *Chautauqua Lake Watershed Management Plan*, September 2010

This plan was developed to ensure the sustainability of Chautauqua Lake and the region. It characterizes the watershed and includes a Five Year Action Plan. It also includes an Executive Summary with recommended roles for municipal officials, agencies & organizations, residents/landowners, farmers, projects manager, developers, and users.

http://www.planningchautauqua.com/watershed/chautlake_mgmt_plan.htm

Buffalo Niagara Riverkeeper, *Sanitary Sewer Overflows and Combined Sewer Overflows in Western New York*, 2007

Summarizes results of Buffalo Niagara Riverkeeper water quality testing in several Erie County municipalities.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Center for Watershed Protection, *Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program*, July 2008

This guide is intended for Phase II NPDES Municipal Separate Storm Sewer System (MS4) communities, and other smaller unpermitted MS4s that are interested in protecting local water resources. It contains chapters that address key elements of a post-construction program, and several companion tools. The tools are designed to be downloaded and adapted by local programs to help build their capabilities. <http://www3.epa.gov/npdes/pubs/stormwaterinthecommunity.pdf>

Center for Watershed Protection, *The Practice of Watershed Protection*, 2000

This book presents what was known about both the science and management of small watersheds, with a strong emphasis on those that are experiencing rapid development. The 150 articles were primarily drawn from feature articles and technical notes published in the journal Watershed Protection Techniques. http://www.stormwatercenter.net/Library/Practice_Articles.htm

Chemung County Soil & Water Conservation District, *Stream Processes- A Guide to Living in Harmony with Streams*, August 2006

Includes sections on: how do streams work?, assessing the condition of a stream, managing streams, utilizing stream corridors, living in watersheds, and legal issues with many photographs.

<http://www.catskillstreams.org/pdfs/chemungstreamguide.pdf>

Chesapeake Bay Foundation, *2010 State of the Bay*, December 2010

This report is based on the best available information about the Chesapeake for indicators representing three major categories: pollution, habitat, and fisheries. Monitoring data serves as the primary basis for the report, supplemented by field observations. It measures the current state of the Bay against a healthy one. <https://www.cbf.org/document.doc?id=596>

Chester County, PA Board of Commissioners and Water Resources Authority; *Watersheds-Volume 4*, September 2000

This edition discusses the planning objectives for the study area that were developed from analysis of watershed data and discussions with stakeholders.

<http://pa-chestercounty2.civicplus.com/DocumentCenter/View/6525>

Conservation Ontario, *Conservation Authorities-Natural Champions for Healthy Watersheds*

Conservation Authorities protect, restore and manage Canadian watersheds. Most of Ontario's conservation authorities were created over 50 years ago to protect families and homes from floods. They also provide expertise and services in: watershed management, water quality, flooding and erosion, agricultural and rural landowner assistance, and environmental education.

http://conservation-ontario.on.ca/media/natural_champions.pdf

Cornell University Department of Natural Resources for NYS Department of Environmental Conservation's Hudson River Estuary Program, *Creating a Natural Resources Inventory: A Guide for Communities in the Hudson River Estuary Watershed*, 2014

This guide is useful for groups across NYS looking to create a Natural Resource Inventory.

http://www.dec.ny.gov/docs/remediation_hudson_pdf/nriall.pdf

Delaware River Basin Commission, *State of the Delaware River Basin Report 2008*, December 2008

The State of the Basin Report 2008 was designed to serve as a benchmark of current conditions and a point of reference for gauging progress toward management goals. It also provides a platform for measuring and reporting future progress in water resource management, and a guide for adjusting monitoring and assessment programs. It was intended to communicate our understanding of the health of the Basin, to increase public involvement, and to build consensus on a broad array of actions to improve and enhance the Delaware River Basin.

<http://www.state.nj.us/drbc/library/documents/SOTB/entire-singles.pdf>

Don Meltz, *Watershed Planning and GIS: The influence of geographic information systems on the watershed planning process*, November 2008

This paper examines recent changes in water resource planning and GIS technology, and describes how they can best be used together for developing a watershed plan.

<http://www.donmeltz.com/documents/watershedplanning.pdf>

Federal Agencies, Stream Corridor Restoration: Principles, Processes, and Practices, October 1998

The USDA, USEPA, Tennessee Valley Authority, FEMA, U.S. Department of Commerce, U.S.

Department of Defense, U.S. Department of Housing and Urban Development, and U.S. Department of the Interior collaborated on this resource describing an overview of stream corridors, developing a restoration plan, and applying restoration principles.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Genesee/Finger Lakes Regional Planning Council, *Protecting Water Resources through Local Controls and Practices: An Assessment Manual for New York Municipalities*, June 2006

Local governments can use this manual when assessing their capacity to protect water quality and water related resources. It provides a methodology for identifying local governmental controls and other practices that can be used to protect water quality, a way to assess their effectiveness, and suggestions for setting priorities to fill gaps that may exist.

http://www.dos.ny.gov/opd/programs/pdfs/Protecting_Water_Resources.pdf

Izaak Walton League of America, *Handbook for Wetlands Conservation and Sustainability*, June 1998

This handbook describes wetland function, how to establish a stewardship program, monitoring, and taking action, such as controlling invasive species.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Lake Ontario Coastal Initiative, *LOCI news*, Summer 2009, Spring 2010

Includes article about the use of zoning to protect water quality and articles about green infrastructure.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Middle States Geographer, 2003, 36:146-154; John Hasse, et.al., Rowan University; *Characterizing The Land Use/Land Cover Conditions of Two New Jersey Watersheds*

This paper develops a set of landscape characterization indicators for assessing watersheds. The indicators developed include: land utilization and change profiles, percentage of impervious surface, impervious surface increase, and urban intensity.

http://msaag.org/wp-content/uploads/2013/05/17_Hasse_et_al.pdf

National Wildlife Federation, *Natural Defenses in Action: Harnessing Nature to Protect Our Communities*, 2016

This report describes 12 examples of areas across the United States that utilize nature to improve resiliency to storms. It also provides recommendations and best practices.

http://www.nwf.org/~media/PDFs/Global-Warming/Reports/NWF_Natural-Defenses-in-Action_Report.pdf

Natural Resources Defense Council, *Testing the Waters* 2010

New York was rated 23rd in beach water quality in this report based on samples taken during 2009.

<http://www.nrdc.org/water/oceans/ttw/ttw2010.pdf>

New York Sea Grant NEMO Program, *Local Authority for Stormwater Management*, 2005

Reviews stormwater management regulatory options for local governments.

<http://www.seagrant.sunysb.edu/nemo/pdfs/NEMO-EstLocalAuthority.pdf>

NYS Department of Environmental Conservation, *Draft Final report of the Quality of Life Work Group of the New York State Department of Environmental Conservation Comparative Risk Project*, June 2000

The work group evaluated, characterized, and compared the risks and impacts to the quality of life of New York residents from 14 classes of chemicals and pollutants. The report utilized aesthetics, economic well-being, value of healthy ecosystem, future generations, fairness, and peace of mind/sense of community.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

NYS Department of Environmental Conservation & Department of State, *Local Open Space Planning Guide*, May 2007 Reprint

This local open space planning guide is intended to help interested local governments develop and implement local open space conservation programs.

https://www.dos.ny.gov/lg/publications/Local_Open_Space_Planning_Guide.pdf

NYS Department of Environmental Conservation, *New York State Wildlife Action Plan*, September 2015

The strategy uses available data on the status of fish and wildlife species to define a vision and establish a strategy for state wildlife conservation and funding. This was a collaborative effort among agencies, organizations, and persons with an interest in New York's wildlife.

<http://www.dec.ny.gov/animals/7179.html>

NYS Department of Environmental Conservation, *New York State Stormwater Management Design Manual*, January 2015

The Manual was prepared to provide standards for the design of stormwater management practices to protect the waters of New York State from the adverse impacts of urban stormwater runoff. It establishes specifications and uniform criteria for the practices that are part of a Stormwater Pollution Prevention Plan. <http://www.dec.ny.gov/chemical/29072.html>

NYS Department of Environmental Conservation, *Draft Upstate New York Groundwater Management Program*, January 1985

The report reviews facts about ground water, describes problems with upstate ground waters, summarizes government programs that affect ground water and recommends management actions that federal, state, regional and local governments should take to protect upstate New York's ground water. <https://books.google.com/books?id=AdJGAAAYAAJ&dq=editions:OCLC63939535>

NYS Department of Environmental Conservation, NYS Parks, Recreation and Historic Preservation, NYS Department of State, NYS Agriculture and Markets, NYS Department of Transportation, *Conserving Open Space in New York State: New York State Open Space Conservation Plan*, 2016

Open spaces provide clean air and water, outdoor recreation, habitat for plants and animals, protection from storm surges and floods, and many other benefits. This plan recognizes the need to conserve fields, forests, waters and wetlands vulnerable to development.

http://www.dec.ny.gov/docs/lands_forests_pdf/osp2016final1.pdf

NYS Department of Environmental Conservation Division of Water, *Vision Approach to Implement the Clean Water Act 303(d) Program and Clean Water Planning*, December 2015

NY's strategy to prioritize waterbodies on the CWA 303(d) list for clean water planning (TMDLs, watershed plans, permit modifications, long term control plans) is adaptive and systematic, builds on and improves the existing 303(d) program, is based on data collected by DEC, integrates information from other Division of Water programs, incorporates alternative plans when applicable, fosters new partnerships, and enhances existing partnerships.

http://www.dec.ny.gov/docs/water_pdf/dowvision.pdf

NYS Department of Health, *Drinking Water Infrastructure Needs of New York State*, November 2008

Water and wastewater infrastructure is one of the largest and most important assets of municipal governments. This report is an initial step toward the development of a sustainable infrastructure funding program at the federal, state and local levels. A conservative cost estimate of repairing, replacing, and updating New York's drinking water infrastructure is \$38.7 billion over the next 20 years. With limited federal and state assistance available, the burden of maintaining drinking water infrastructure falls primarily on local governments.

https://www.health.ny.gov/environmental/water/drinking/docs/infrastructure_needs.pdf

NYS Department of State, *Guidebook- Watershed Plans: Protecting and Restoring Water Quality*, 2009

This guidebook is the print component of a multi-media package that provides information and resources on how to develop effective local watershed plans. This package provides readily accessible information on how to improve community water quality.

<http://www.dos.ny.gov/opd/programs/pdfs/Guidebooks/watershed/WatershedPlansGuidebook%20wo%20secretary.pdf>

-Other available guidebooks including, *Making the Most of Your Waterfront: Enhancing Waterfronts to Revitalize Communities* and *Opportunities Waiting to Happen: Redeveloping Abandoned Buildings and Sites to Revitalize Communities*, are available at: www.nyswaterfronts.com.

NYS Energy Research and Development Authority, *Draft Responding to Climate Change in New York State*, 2010

This report provides decision makers with current information on NYS's vulnerability to climate change to facilitate the development of adaptation strategies informed by local experience and scientific knowledge. Climate change is already beginning to affect people and resources and these impacts are projected to grow.

<https://webcache.googleusercontent.com/search?q=cache:UKGfvy4yllcJ:https://www.nyserda.ny.gov/-/media/Files/EE/EMEP/Climate-Change/clim-aid-synthesis-draft-text-only.pdf+&cd=2&hl=en&ct=clnk&gl=us>

NYS Legislative Commission on Rural Resources, *New York Land Use Tools-A 2008 Survey of Land Use Planning & Regulations in NYS*, 2008

This report presents the results of a survey of land use tools currently being used by NYS's cities, towns, and villages. Municipalities have shown a continuing interest in adopting basic land use tools.

https://www.dos.ny.gov/lg/publications/Rural_Resource_Survey.pdf

Office of the NYS Comptroller, *Economic Benefits of Open Space Preservation*, March 2010

While the environmental and recreational benefits of open space preservation are readily apparent, the many economic benefits are often less evident. For example, benefits such as water preservation and storm water control are often significant. In many instances it is less expensive for a community to maintain open space that naturally maintains water quality, reduces runoff, or controls flooding than to use tax dollars for costly engineered infrastructure projects.

http://www.dec.ny.gov/docs/lands_forests_pdf/openspacepres.pdf

Save The River, *Sewage Handbook-A Guide for Shoreline Residents in the 1000 Islands Region*, 2004

Presents a review and information about local and state sewage regulations, and available on-site sewage treatment systems, effluent treatment systems, alternative toilets, and gray water disposal systems. <http://www.savetheriver.org/docs/STR%20SewHandbook.pdf>

Schroon Lake Watershed Management Planning Committee, *Schroon Lake Watershed Management Plan*, 2010

This plan is a comprehensive review of the state of Schroon Lake and its watershed, outlining considerable information related to the lake and its surrounding lands. The goal of this initiative was to identify issues affecting the water quality and ecology of Schroon Lake, and to outline specific recommendations to protect the lake for the future.

<https://www.warrenswcd.org/reports/schroon2.pdf>

U.S. Department of Agriculture, Natural Resources Conservation Service, National Water and Climate Center; *Stream Visual Assessment Protocol*, December 1998

This document presents an assessment protocol to evaluate the condition of aquatic ecosystems associated with streams.

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044776.pdf

U.S. Department of Agriculture Forest Service, *Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources*, date unknown

Details the importance of riparian buffers by describing the benefits to the ecosystem including nutrient storage, erosion control, sediment filtration, habitat corridors, and stream shading & cooling.

http://www.na.fs.fed.us/spfo/pubs/n_resource/riparianforests/

U.S. Department of Agriculture Soil Conservation Service, *Erosion and Sediment Inventory*, August 1974

Inventory includes information about erosion and sediment issues in New York State including sheet erosion summaries for counties and watersheds and sediment delivery estimates.

http://www.worldcat.org/title/erosion-and-sediment-inventory-new-york/oclc/62290199&referer=brief_results

U.S. Environmental Protection Agency, *Coming Together for Clean Water-EPA's Strategy to Protect America's Waters*, March 2011

On April 15, 2010 USEPA Administrator Lisa Jackson convened a diverse group of stakeholders to discuss opportunities to reinvigorate USEPA's strategy for achieving clean water. This strategy outlines the challenges that were highlighted at the *Coming Together for Clean Water* forum, describes the public participation process, and highlights the USEPA's priorities for achieving clean water goals.

<https://blog.epa.gov/waterforum/wp-content/uploads/2011/04/ComingTogether-for-Clean-Water-FINAL.pdf>

U.S. Environmental Protection Agency, *Getting in Step-A Guide for Conducting Watershed Outreach Campaigns*, December 2003

New and improved tips and tools for creating awareness, educating specific audiences, and motivating positive change for improving water quality. This guide offers advice on how watershed groups, local governments, and others can maximize the effectiveness of public outreach campaigns to reduce nonpoint source pollution.

[https://engineering.purdue.edu/watersheds/resources/Academy/Getting_in_Step_Watershed Outreach Campaigns.pdf](https://engineering.purdue.edu/watersheds/resources/Academy/Getting_in_Step_Watershed_Outreach_Campaigns.pdf)

U.S. Environmental Protection Agency, *Green Infrastructure Data Quantification & Assessment*, March 2009

The Center for Neighborhood Technology and Hey Associates Inc., have conducted research to monitor and document the performance of green infrastructure for stormwater management. They designed, constructed and monitored two bioswales to capture and infiltrate runoff from parking lots. And two rain gardens to capture roof runoff. <http://www.cntprojects.net/repository/USEPA%20-%20GI%20Data%20Quantification%20&%20Assessment.pdf>

U.S. Environmental Protection Agency, *Handbook for Developing Watershed Plans to Restore & Protect Our Waters*, 2008

This handbook provides information on developing and implementing comprehensive watershed management plans. Intended for agencies or organizations working in watersheds that are threatened. The handbook, which is comprehensive in scope and detail, covers aspects from building partnerships to financial strategies. The appendices cover various resources, worksheets and contacts for anyone looking to conduct a scientifically defensible watershed management plan.

http://www.epa.gov/sites/production/files/2015-09/documents/2008_04_18_nps_watershed_handbook_handbook-2.pdf

U.S. Environmental Protection Agency, *Identifying and Protecting Healthy Watersheds-Concepts, Assessments, and Management Approaches Draft*, February 2011

The purpose of this report is to provide an overview of the key concepts behind the healthy watersheds approach, examples of approaches for assessing components of healthy watersheds, an integrated assessment framework to identify healthy watersheds, examples of management measures, and key assessment tools and sources of data.

<https://owpubauthor.epa.gov/polwaste/nps/watershed/upload/hwi-watersheds-complete.pdf>

U.S. Environmental Protection Agency, National Coastal Conditions Assessment, December 2015

This is the fifth in a series of reports assessing the condition of the coastal waters of the United States, including the Great Lakes. It is part of the National Aquatic Resource Surveys (NARS), a series of statistically based surveys designed to provide the public and decision makers with nationally consistent and representative information on the condition of all the nation's waters.

<https://www.epa.gov/national-aquatic-resource-surveys/national-coastal-condition-assessment-2010-results>

U.S. Environmental Protection Agency, National Lakes Assessment 2012: A Collaborative Survey of the Lakes in the United States, 2012

The National Lakes Assessment was first conducted in 2007 and was the first ever baseline study of the Nation's lakes conditions. The Great Lakes were not included in the survey. The NLA provides estimates of the condition of natural and man-made freshwater lakes, ponds, and reservoirs greater than 10 acres and least one meter deep. https://www.epa.gov/sites/production/files/2016-12/documents/nla_report_dec_2016.pdf

U.S. Environmental Protection Agency, *National River and Streams Assessment 2008-2009: A Collaborative Study*, March 2016

During the summers of 2008 and 2009, more than 85 field crews sampled 1,924 river and stream sites across the country representing nearly 1.2 million miles. Using standardized field methods, they sampled waters as large as the Mississippi River and as small as mountain headwater streams. Sites were selected using a randomized sampling technique that uses a probability-based design. This design ensures that the results of the survey reflect the variety of river and stream types and sizes across the United States. Results are presented nationally as well as by regions (three climatic and nine ecological regions).

https://www.epa.gov/sites/production/files/2016-03/documents/nrsa_0809_march_2_final.pdf

U.S. Environmental Protection Agency, National Wetland Condition Assessment 2011, May 2016

During the spring and summer of 2011, more than 50 field crews sampled 1,179 wetland sites across the country. Each crew used standardized field protocols to sample vegetation, soils, hydrology, algae, water chemistry, and potential stressors at each site. Most sites were selected using a random sampling technique that ensures that the results of the survey reflect the range of wetlands in the target population across the U.S. Data collected at these randomly selected sites are used to produce national and regional estimates of wetland condition.

https://www.epa.gov/sites/production/files/2016-05/documents/nwca_2011_public_report_20160510.pdf

U. S. Environmental Protection Agency, *Protecting Water Resources with Smart Growth*, May 2004

This connects transportation, zonings, building codes, and land development to the Clean Water Act and gives 75 examples of policies for planning and zoning boards to protect water quality.

<https://www.epa.gov/smartgrowth/protecting-water-resources-smart-growth>

U.S. Environmental Protection Agency, *Using Smart Growth Techniques as Stormwater Best Management Practices*, December 2005

This manual is a comprehensive guide to using smart growth strategies to reach environmental, community and economic goals. It provides practical information on the various smart growth

approaches, technologies and techniques that communities can use to meet water quality goals and regulatory requirements. Sections summarize NPDES stormwater regulations, the effects of development on runoff, and introduces smart growth techniques as best management practices. Included are a comprehensive resource guide and a case study on New Jersey's smart growth program. http://archive.epa.gov/greenbuilding/web/pdf/sg_stormwater_bmp.pdf

U.S. Environmental Protection Agency, *Wadeable Streams Assessment: A Collaborative Survey of the Nation's Streams*, 2006

The Wadeable Streams Assessment is a first ever, statistically valid survey of the biological condition of streams throughout the United States. The WSA was designed to provide regional and national assessments of stream quality. 1,392 random sites were sampled, but there were not enough sites surveyed to allow statistically valid assessments at the state level. The sampling was completed in 2004. <http://nepis.epa.gov/Exe/ZyPDF.cgi/901V1R00.PDF?Dockkey=901V1R00.PDF>

U.S. Environmental Protection Agency, *Water Quality Scorecard-Incorporating Green Infrastructure Practices at the Municipal, Neighborhood, and Site Scales*, October 2009

Was developed to help local governments identify opportunities to remove barriers, revise and create codes, ordinances, and incentives for better water quality protection. The two main goals of this tool are to: (1) help communities protect water quality by identifying ways to reduce stormwater flows and (2) educate stakeholders on the wide range of policies and regulations that have water quality implications.

<http://www.epa.gov/sites/production/files/2014-04/documents/water-quality-scorecard.pdf>

U.S. Geological Survey, *Draft Report to Congress: Strengthening the Scientific Understanding of Climate Change Impacts on Freshwater Resources of the United States*, March 2011

This draft report identifies key actions to improve the Nation's capacity to detect and predict changes in freshwater resources that are likely to result from a changing climate. A series of next steps for federal agencies is provided and the goal is to facilitate improvements in observational, data acquisition, and modeling capabilities. <http://acwi.gov/Rpt.Congress3.18.11.pdf>

U.S. Geological Survey, *Water Budgets: Foundations for Effective Water Resources and Environmental Management*, 2007

This report provides an overview of the hydrologic cycle and a discussion of methods for determining water budgets, demonstrates how water budgets can be incorporated into management practices.

<http://water.usgs.gov/watercensus/AdHocComm/Background/WaterBudgets-FoundationsforEffectiveWater-ResourcesandEnvironmentalManagement.pdf>

U.S. Geological Survey, *Ground Water Quality in Western New York*, 2006

Water samples were collected from 7 production wells and 26 private residential wells in western New York from August through December 2006 and analyzed to characterize the chemical quality of the water. Results indicate that ground water used for drinking supply is generally of acceptable quality, although concentrations of some constituents or bacteria exceeded at least one drinking water standard at 27 of the 33 wells. <http://pubs.usgs.gov/of/2008/1140/pdf/OFR2008-1140.pdf>

GREAT LAKES RESOURCES

Government of Canada and Government of the United States of America, *Great Lakes Water Quality Agreement: Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality, 1978, as Amended on October 16, 1983 and on November 18, 1987*, 2012

This is an update to the agreement between the two governments to restore and maintain the chemical, physical, and biological integrity of the Great Lakes waters. It addresses specific areas of attention in ten annexes.

http://binational.net/wp-content/uploads/2014/05/1094_Canada-USA-GLWQA-e.pdf

Great Lakes Basin Advisory Council, *Our Great Lakes Water Resources: Conserving and Protecting Our Water Today for Use Tomorrow*, August 2010

This report is designed to fully respond to the directive by the State Legislature to the Great Lakes Basin Advisory Council in 2008, and to stimulate a dialogue within NYS regarding how our water resources can best be managed, and to guarantee sustainable resources for future generations. An approach was defined to develop recommendations that are consistent with a set of guiding principles. http://www.dec.ny.gov/docs/regions_pdf/glbacfrpt.pdf

Great Lakes Coastal Wetlands Consortium, *Great Lakes Coastal Wetlands Monitoring Plan*, March 2008

This program is designing standard protocols and delineating benchmarks for the implementation of a binational/basinwide monitoring program capable of tracking and assessing the existing status and projected integrity of Great Lakes coastal wetlands. <http://glc.org/files/docs/Great-Lakes-Coastal-Wetlands-Monitoring-Plan-FINAL-March-2008.pdf>

Great Lakes Commission, *Strengthening Great Lakes Monitoring and Assessment*, July 2006

The Great Lakes Commission developed a centralized repository of Great Lakes monitoring information, the Great Lakes Monitoring Inventory and Gap Analysis that was the first comprehensive bi-national inventory of monitoring programs in the Great Lakes Basin. http://www.worldcat.org/title/strengthening-great-lakes-monitoring-and-assessment-legislative-guidance/oclc/812893876&referer=brief_results

Great Lakes Commission, *Liquid Asset: Great Lakes Water Quality and Industry Needs*, October 1992

This report addresses the importance of water to the Great Lakes economy. Water quality issues as they relate to industry use of fresh water are a primary focus. Five specific uses of Great Lakes and St. Lawrence River water are examined.

http://www.worldcat.org/title/liquid-asset-great-lakes-water-quality-and-industry-needs/oclc/31785878&referer=brief_results

Great Lakes Executive Committee, *Progress Report of the Parties*, 2016

This is the first report of the United States of America and Canada since the new Great Lakes Water Quality Agreement took effect in February 2013. This report details the ongoing projects and is required to be updated every 3 years.

<https://binational.net/wp-content/uploads/2016/09/PRP-160927-EN.pdf>

Great Lakes Executive Committee Annex 8 Subcommittee, *Groundwater science relevant to the Great Lakes Water Quality Agreement: A status report*, May 2016

The Great Lakes Water Quality Agreement of 2012 created Annex 8 Groundwater to address groundwater issues in the Great Lakes. This report was created to express the current understanding of groundwater science.

<https://binational.net/wp-content/uploads/2016/05/GW-Report-final-EN.pdf>

Great Lakes Fishery Commission-Lake Erie Committee, *Lake Erie Environmental Objectives*, July 2005

Ten environmental objectives have been identified to address achievement of the 13 Fish Community Goals and Objectives. Restoration of natural physical processes to the extent possible will promote recovery or recreation of a more natural habitat and further allow the Lake Erie fish community to adapt to forecasted declines in water levels.

http://www.glfc.org/lakecom/lec/LEC_docs/other_docs/EOs_July5.pdf

Great Lakes Interagency Task Force, *Great Lakes Restoration Initiative Action Plan II*, September 2014

This action plan summarizes actions of federal agencies planned from 2015 through 2019 using the Great Lakes Restoration Initiative funding. It focuses on cleaning up Areas of Concern, preventing and controlling invasive species, reducing nutrient runoff/Harmful algal blooms, and restoring native habitat.

<https://www.glri.us/actionplan/pdfs/glri-action-plan-2.pdf>

Great Lakes Program, New York Sea grant, and Great Lakes Research Consortium, *Great Lakes Research Review, Understanding Toxic Substance Exposure in the Great Lakes*, July 1994

This Vol. 1 Issue No. 1 focuses on studies involving toxic substances in the Great Lakes. Other volumes exist on topics such as, Lake Erie, Lake Ontario, Fisheries, Harmful Algal Blooms, and more.

<http://www.esf.edu/glrc/library/glrr.htm>

Great Lakes Regional Collaboration, *Mercury Emission Reduction Strategy*, December 2010

This Strategy seeks to complement and enhance the recommendations in the Quicksilver Caucus's Action Plan and Implementation Strategy for reducing mercury in the environment. Implementation of this strategy is one important element in achieving virtual elimination of mercury inputs into the Great Lakes as envisioned in the Great Lakes Bi-national Toxics Strategy.

<http://www.glrppr.org/glmst/Mercury-Emissions-Reduction-Strategy.pdf>

Great Lakes Regional Collaboration, *Great Lakes Regional Collaboration Strategy*, December 2005

This strategy is intended to build upon the extensive regional efforts to date, working together toward a common goal of restoring and protecting the Great Lakes ecosystem. The work of the strategy teams includes many recommendations for action focused on the steps that should be taken over the next five years to proceed with restoration actions.

http://www.glrppr.org/meetings/strg_plan_2005/glrcs.pdf

Healing Our Waters-Great Lakes Coalition, *Turning the Tide: Investing in Wastewater Infrastructure to Create Jobs and Solve the Sewage Crisis in the Great Lakes*, August 2010

Eliminating combined sewage overflows needs to be an essential part of the effort to restore the Great Lakes and revive its economy. The report highlights five cities, Buffalo, Cleveland, Detroit, Gary Ind., and Milwaukee, that are facing these challenges. <https://www.nwf.org/pdf/Water/08-02-2010HOWSewageReportFINAL.pdf>

International Joint Commission, *A Balanced Diet for Lake Erie Reducing Phosphorus Loadings and Harmful Algal Blooms: A Report of the Lake Erie Ecosystem Priority (LEEP)*, February 2014

The objective of LEEP is to provide federal, state, provincial, and local governments with advice on developing policy and management practices to reduce nutrient loads to Lake Erie to restore the ecosystem.

<http://www.ijc.org/files/publications/2014%20IJC%20LEEP%20REPORT.pdf>

International Joint Commission, *Sixteenth Great Lakes Water Quality Biennial Report*, April 2013

The Commission is charged with preparing a report to the federal, state and provincial governments that assess progress to meet the Great Lakes Water Quality Agreement. This report details the biological, physical and chemical integrity of the Great Lakes.

http://www.ijc.org/files/publications/16thBE_internet%2020130509.pdf

International Joint Commission Great Lakes Water Quality Board, *Evaluating Watershed Management Plans – Nutrient Management Approaches in the Lake Erie Basin and Key Locations Outside of the Lake Erie Watershed*, March 2016

This review determined that many nutrient management plans do not contain the level of detail required for an effective response plan. Assessments of sources tended to be qualitative rather than quantitative and effective plans need clear goals, intermediate milestones, and an adaptive management process to include economic cost-benefit analysis. There is a need for a consistent watershed-specific approach across all Lake Erie basins. Coalition building is important for implementation and public awareness is needed. Finally, a comprehensive monitoring program should be in place.

http://www.ijc.org/files/tinymce/uploaded/WQB/WQB_LakeErieReport_Aug2016.pdf

Lake Erie LaMP Management Committee, *Lake Erie Lakewide Management Plan*, April 2008

Lakewide Management Plans (LaMPs), now called Lakewide Action and Management Plans (LAMPs) are action plans that assess, restore, protect and monitor the health of the five Great Lakes. They are an example of an ecosystem approach to adaptive management that integrates environmental, economic and social considerations along ecological rather than geopolitical boundaries. The Lake Erie Plan can be accessed here: <https://www.epa.gov/sites/production/files/2015-10/documents/lake-erie-lamp-2008.pdf>

Lake Erie Partnership, *Lake Erie Lakewide Action and Management Plan-Annual Report 2016*

Lake Erie Lakewide Action and Management Plan participants continue to tackle the challenge of managing this variable and sensitive ecosystem. This report summarizes recent progress and accomplishments. Reports are issued annually.

<https://binational.net/wp-content/uploads/2016/10/LE-LAMP-2016.pdf>

Lakewide Management Annex Nearshore Framework Task Team, *The Great Lakes Nearshore Framework*, September 2016

The Task Team is a joint effort by U.S. and Canadian members to provide a plan for moving forward on a comprehensive assessment of nearshore waters according to the Great Lakes Water Quality Agreement. This will include identifying areas requiring action.

<https://binational.net/wp-content/uploads/2016/09/Nearshore-Framework-EN.pdf>

Metropolitan Policy Program at Brookings, *Leveraging the Great Lakes Region's Water Assets for Economic Growth*, September 2010

Sustainable fresh water use and emerging clean-tech water systems and applications present the region with new opportunities to capitalize on its water assets. As Great Lakes waters are cleaned and made available for development, recreation, and tourism they enrich the region's quality of life and can help stimulate economic growth.

http://www.brookings.edu/~media/Research/Files/Papers/2010/9/27-great-lakes/0927_great_lakes_water.PDF

National Wildlife Federation, *Improving the Odds: Using Climate-Readiness Planning to Reduce the Impacts of Climate Change on the Great Lakes Ecosystem*, October 2010

This report features current climate-ready practices, policies, and tools that help build adaptive capacity and lead the way for adaptation. It also describes and analyzes climate-readiness initiatives in the Great Lakes. <https://www.nwf.org/pdf/Reports/Great-Lakes-Adaptation.pdf>

The Nature Conservancy, *Managing Habitats for Migrating Land Birds in the Western Lake Erie Basin*, 2008

This is a practical guide describing how private landowners and managers of corporate lands, city parks and other public areas can manage habitats to assist birds as they migrate through the Great Lakes region.

<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/ohio/explore/bird-stopover-brochure.pdf>

The Nature Conservancy, *Returning to a Healthy Lake: An International Biodiversity Conservation Strategy for Lake Erie*, date unknown

The Lake Erie Biodiversity Conservation Strategy (LEBCS) is a binational initiative designed to support the efforts of the Lake Erie LaMP by identifying specific strategies and actions to protect and conserve the native biodiversity of Lake Erie. It is the product of a two-year planning process involving over 190 from 87 agencies and organizations around the basin.

<https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/wholesystems/greatlakes/Pages/lakeerie.aspx>

The Nature Conservancy-Great Lakes Program, *Toward a New Conservation Vision for the Great Lakes Region: A Second Iteration*, September 2000

The Great Lakes ecoregional planning initiative is a systematic approach that identifies native species, natural communities, and aquatic systems characteristic of the Great Lakes region. It then determines how many of and where these elements of biodiversity need to be protected over the long term. This initiative also identifies broad-scale threats to Great Lakes biodiversity and begins to develop

strategies to address them.

<https://www.conservationgateway.org/ConservationPlanning/SettingPriorities/EcoregionalReports/Documents/Summdoc.PDF>

New York Ocean and Great Lakes Ecosystem Conservation Council, *Our Waters, Our Communities, Our Future: Taking Bold Action Now to Achieve Long-term Sustainability of New York's Ocean and Great Lakes*, April 2009

The NYS Legislature created the Council to allow greater coordination among nine key state agencies and to lay a foundation for implementing an ecosystem-based management approach for the long term sustainability of these resources. The report recommends an implementation strategy that accounts for the impacts of a diverse set of human activities by developing comprehensive approaches and integrated partnerships.

http://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1054&context=tech_rep

NYS Department of Environmental Conservation Great Lakes Program, *New York's Great Lakes Basin: Interim Action Agenda*, July 2014

This action agenda brings together many existing environmental, social and economic goals previously identified for New York's Great Lakes region, using an integrated ecosystem-based management approach. The ten priority goals, and many of the identified actions, are drawn from those plans, and are aligned with the priorities in the Great Lakes Restoration Initiative. These goals establish a framework for New York's near-term priorities.

http://www.dec.ny.gov/docs/regions_pdf/glaai.pdf

NYS Department of Environmental Conservation, *25 Year Plan for the Great Lakes*, June 1992

The plan was intended to serve as the management framework to promote the long term vitality of the New York Great Lakes ecosystem. It recommends programs to assist in achieving the following six goals: formulate a shared vision, restore water integrity, manage water resources, preserve and improve natural resources, sustainable economic development, and improve intergovernmental relationships. http://www.dec.ny.gov/docs/regions_pdf/25year.pdf

NYS Department of Environmental Conservation, *PCBs and Organochlorine Pesticide Residues in Young-of-Year Fish from New and Traditional Nearshore Sampling areas in the Western Portion of New York State's Great Lakes Basin*, 2009, January 2011

In September 2009, 144 young-of-year fish composites were collected from near-shore areas within the western portion of New York State's Great Lakes Basin for polychlorinated biphenyl (PCB) and organochlorine (OC) pesticide residue monitoring. Some of the most PCB contaminated of the 20 sites tested are: Gill Creek at Buffalo Avenue, Twomile Creek, Gratwick-Riverside Park and upstream Bergholtz Creek. Four other sampling locations including Cayuga Creek, Niagara County at Lindberg Avenue and Porter Road, and the upstream and downstream Little Niagara River, exceeded the non-detect Mirex objective designed to protect piscivorous wildlife. Recommendations are presented for sites needing additional remediation. http://www.dec.ny.gov/docs/fish_marine_pdf/pcbpestinfish.pdf

U.S. Army Corps of Engineers, *Great Lakes and Mississippi River Interbasin Study Focus Area 2: Aquatic Pathway Assessment Report, East Mud Lake, New York*, May 2013

This assessment characterizes the likelihood that aquatic invasive species might cross between the Great Lakes Basin and the Mississippi River Basin at Forestville, NY between the headwaters of Silver Creek and North Branch Conewango Creek. <http://glmris.anl.gov/other-pathways/>

U.S. Geological Survey, *Areal Distribution and Concentrations of Contaminants of Concern in Surficial Streambed and Lakebed sediments, Lake Erie-Lake Saint Clair Drainages, 1990-97, 2001*

Contaminants at more than 800 sampling locations are characterized in this report. Surficial bed-sediment-quality data collected from 1990 to 1997 in the Lake Erie-Lake Saint Clair Drainages were evaluated to reflect recent conditions.

<https://pubs.er.usgs.gov/publication/wri004200>

U.S. Geological Survey, *Water Quality in the Lake Erie-Lake Saint Clair Drainages: Michigan, Ohio, Indiana, New York, and Pennsylvania, 1996-1998, 2000*

This report focuses on pesticides, fertilizers, bed sediments, nitrates, and PCBs, including the Niagara River/Lake Erie watershed.

<http://oh.water.usgs.gov/reports/circ1203.pdf>

U.S. Geological Survey, *National Water-Quality Assessment of the Lake Erie-Lake St. Clair Basin, Michigan, Indiana, Ohio, Pennsylvania, and New York-Environmental and Hydrologic Setting, 1998*

This Water-Resources Investigations Report details the environmental and hydrologic setting of the entire Lake Erie basin in the United States.

<https://pubs.er.usgs.gov/publication/wri974256>

U.S. Geological Survey-Great Lakes Science Center, *Sediment Reduction in the Great Lakes Basin: A Strategic View*, March 2004

This report summarizes the preliminary findings and recommendations from a sediment reduction workshop held March 2, 2004, and identifies potential regional courses of action for reducing sediment within the Great Lakes and their connecting channels.

http://projects.glc.org/basin/pubs/pdf/Mar_2004_Workshop_Proceedings.pdf

REGIONAL REPORTS

Erie and Niagara Counties, *Framework for Regional Growth*, 2006

The Framework is intended to assist the public and private sectors in both counties to make coordinated decisions about growth and development. It establishes a regional development vision and outlines policies, programs, and projects that are consistent with that vision. It calls for the conservation and protection of the region's most sensitive natural systems and regionally significant resources including its lakefronts, waterways, wetlands, floodways, and forested lands. It also recommends that priorities be established for the conservation of regionally-significant riparian corridors and related wetland areas.

<http://uploads.oneregionforward.org/content/uploads/2012/12/Framework-for-Regional-Growth-Plan.pdf>

Genesee County Emergency Management Office, *Genesee & Wyoming Counties Joint Flood Mitigation Plan: Wyoming County*, August 2003

The Joint Flood Mitigation Planning Committee reviewed flood risks and hazards, encouraged public involvement, developed mitigation activities, and recommended action steps to alleviate flood-related problems in the municipalities along Tonawanda and Oatka Creeks. The report describes and summarizes the Committee's findings and recommendations.

<http://www.gflrpc.org/uploads/3/1/9/1/31916115/wyomingcounty.pdf>

Kamakaris, David G., *Spatial Analysis of Precipitation in Western New York and Northwestern Pennsylvania*, May 1998

This thesis analyses precipitation variations utilizing precipitation data from weather stations throughout western New York and Northwestern Pennsylvania. It also includes average precipitation data from 1954-1985.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

University at Buffalo Regional Institute, *One Region Forward: A New Way to Plan for Buffalo Niagara*, February 2015

Through the use of extensive community planning, five main ideas arose for the region including efficient land use, diversifying transportation, providing quality housing choices, strengthening food systems, and preparation for climate change through sustainable design.

https://issuu.com/buffaloarchplan/docs/a_new_way_to_plan_for_buffalo_niagara

University at Buffalo Urban Design Project, *Mapping Waste: Setting the Stage to Clean-Up Niagara*, December 2012

This report documents hazardous and radioactive waste sources in Cattaraugus, Erie, and Niagara counties showing that WNY is disproportionately affected. It includes type of waste, quantity, and location of waste and has been used to inform elected officials in the area.

<https://www.scribd.com/document/92743749/Mapping-Waste-Setting-the-Stage-to-Clean-Up-Niagara>

***Western New York Regional Sustainability Plan*, 2013**

This report includes five counties, Niagara, Erie, Chautauqua, Cattaraugus, and Allegany. Public, private, and not-for-profit entities discussed the strengths of the region and formulated goals for sustainable growth including conservation and enhancement of natural resources while promoting economic development. It includes a list of potential projects.

<https://regionalcouncils.ny.gov/sites/default/files/regions/westernny/Western-NY-CGC-Plan-Report.pdf>

Western New York Tourism Work Group, *A Strategy for Heritage Tourism in Western New York*, May 2013

The vision calls for the development of an integrated experience for visitors and residents that "connects the dots" across Allegany, Cattaraugus, Chautauqua, Erie, and Niagara counties through themes, places, stories, and people. These include natural wonders such as water features.

<https://regionalcouncils.ny.gov/themes/nyopenrc/rc-files/westernny/path-through-history-May-2013.pdf>

COUNTY REPORTS

ALLEGANY COUNTY

Allegany County Comprehensive Plan Review Committee & The Allegany County Office of Development, *2020 Vision Allegany County Comprehensive Plan 2013 – 2023*, October 2013

This report recognizes the steep slopes, geography, and flood plains of the County with the goal to wisely develop and utilize natural resources in order to foster economic security without compromising the quality of the living environment. Only portions of Centerville and Rushford are part of the Niagara River/Lake Erie watershed. <http://www.alleganyplanning.com/Compplan2013.htm>

Cornell Cooperative Extension of Allegany County, *Allegany County, New York Agricultural Development and Farmland Enhancement Plan*, date unknown

This report covers the connection between farming and natural resources within the County. It details what agriculture and forestry means to the economics of the County and what the general trends have been. <http://www.alleganyplanning.com/pdfs/Farmland%20Plan.pdf>

CATTARAUGUS COUNTY

Agricultural and Community Development Services, LLC, *Agricultural and Farmland Protection Plan for the Cattaraugus County Agricultural and Farmland Protection Board*, February 2007

The purpose of this is to analyze and understand the foundations of Cattaraugus County's agricultural economy and to create an Agricultural and Farmland Protection Plan. Recommendation 8-11 address land use issues.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Cattaraugus County Agricultural Environmental Management (AEM) Steering Committee, *Cattaraugus County Agricultural Environmental Management Strategy*, April 2015.

Strategy includes: County agricultural statistics, county-wide and watershed based priority water resource concerns, AEM program history & future goals & objectives, and history of awarded NYS Agricultural NPS funding programs. Copy can also be obtained by contacting Cattaraugus County Soil & Water Conservation District, 8 Martha Street, PO Box 1765, Ellicottville, NY 14731, (716) 699-2326 ext. 110, e-mail briandavis47@hotmail.com.

Cattaraugus County Department of Economic Development, Planning, and Tourism and Wendel, *Vision 2025 Comprehensive Plan: Moving Cattaraugus County Forward*, December 2015

This comprehensive plan for the county builds on previous plans while addressing current issues and taking current trends into consideration. It focuses on economic development while protecting the resources of the County, including natural resources utilized for recreation and tourism.

<http://www.cattco.org/files/downloads/planning/20160328-cattaraugus-county-comp-plan.pdfsanitary>

Cattaraugus County Planning Board, *A New Look at Gravel Mining in Cattaraugus County (Twenty First Century Planning for the Route 16 Corridor)*, September 2000

The purpose of this report is to provide education, strategies for cooperation, protect the environment, and promote mining and community growth in a responsible manner.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Cattaraugus County Water Quality Council, *Water Quality Strategy for Cattaraugus County, 4th Edition*, April 1999.

The Strategy includes: Catt. Co. WQ Council organization & functions, priority water problems and concerns in the county, and goals and objectives for addressing nonpoint source pollution in Cattaraugus County.

-Paper copies can be obtained by contacting Cattaraugus County Soil & Water Conservation District, 8 Martha Street, PO Box 1765, Ellicottville, NY 14731, (716) 699-2326 ext. 110, e-mail

briandavis47@hotmail.com.

CHAUTAUQUA COUNTY

Arendt, Randall, *Visualizing our Options, Creating a Better Future: Chautauqua County Design Principles Guidebook*, May 2009

Design principles including landscaping, open space preservation, and stormwater management are explained in this guide.

<http://www.dunkirktoday.com/wp-content/uploads/Chautauqua-County-Design-Principles-Guidebook.pdf>

Chautauqua County Department of Health and Human Services, *Sanitary Survey Assessment Report for Lake Erie Beaches Located in Chautauqua County, NY*, July 2015

This report documents beach and stream sanitary surveys in Chautauqua County and City of Dunkirk storm sewer inspections from 2012-2015.

<http://ny-chautauquacounty.civicplus.com/DocumentCenter/View/2649>

Chautauqua County Department of Planning & Economic Development, *Chautauqua 20/20*, April 2011

The Comprehensive Plan provides a prioritized list of recommended actions to be taken to realize a shared long-term vision for the county. Certain goals may have an impact on water quality.

<http://www.planningchautauqua.com/?q=content/final-report>

Chautauqua County Department of Planning & Economic Development, *Chautauqua County Farmland Protection Plan*, September 2000

The Chautauqua County Farmland Protection Plan is designed to enhance opportunities for the growth and development of agriculture and agribusiness and the preservation and protection of viable farmland in Chautauqua County.

<http://www.planningchautauqua.com/?q=content/farmland-protection-plan>

Chautauqua County Department of Planning & Economic Development, *Chautauqua County Greenway Plan*, April 2012

This plan proposes various multi-use trails throughout the County to preserve and promote natural assets throughout the county. It further develops ideas expressed in the Chautauqua 20/20 Comprehensive Plan.

<http://www.planningchautauqua.com/?q=content/greenways-plan>

Chautauqua County Soil and Water Conservation District, *Erosion and Sedimentation Education for Lake Erie Schools*, July 2002

The final report for this Great Lakes restoration Initiative project details the procedures for teacher training on stream monitoring.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Northern Chautauqua County Intermunicipal Local Waterfront Revitalization Program, *The Communities of Northern Chautauqua County on Lake Erie: Restoring Waterfronts, Revitalizing Waterfront Communities Draft*, June 2015

Funded by NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund, this report is a collaborative effort between ten Chautauqua County communities along the Lake Erie shoreline to create a plan for moving forward with responsible development.

<http://www.planningchautauqua.com/?q=content/northern-chautauqua-county-local-waterfront-revitalization-program>

Peter J. Smith and Company, Inc., *Chadwick Bay Region Comprehensive Plan*, 1997

This regional plan included six Lake Erie municipalities in Chautauqua County, but now serves as the Comprehensive Plan for the City of Dunkirk. The Generic Environmental Impact Statement is included.

<http://www.dunkirktoday.com/wp-content/uploads/Chadwick-Bay-Region-Comprehensive-Plan-1.pdf>

Peter J. Smith and Company, Inc., *Lake Erie Concord Grape Belt: Heritage Area Management Plan*, August 2010

This report offers a plan for preserving and promoting the grape-growing region along Lake Erie shoreline in Chautauqua County celebrating the heritage, culture, and natural resources with a focus on economic development.

<http://www.townofdunkirkcomprehensiveplan.org/Grape-Belt-Heritage-Area-Management-Plan.pdf>

Roger Tory Peterson Institute, *Natural History Atlas to the Chautauqua-Allegheny Region: A Community Resource to Promote Appreciation and Understanding of our Natural Resources*, 2001

This report highlights natural areas in Chautauqua County including those in the Lake Erie Watershed.

<http://rtpi.org/education/naturalhistoryatlas/>

Wilson, Michael P. and Katie R. Boyle, *"Water Net" The Chautauqua County Water Network Ten Year Overview 2001-2010*, June 2010

The WaterNet is a collection of precipitation, stream, lake and well measuring sites with their attendant instruments and records. These data are analyzed to yield an accurate description of the hydrologic state of the area.

<http://www.fredonia.edu/org/WaterNet/>

ERIE COUNTY

Buffalo Niagara Riverkeeper, *Sanitary Sewer Overflows and Combined Sewer Overflows in Western New York*, 2007

Summarizes results of Riverkeeper water quality testing in several Erie County municipalities.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Citizens Environmental Research Institute, *Sewage Discharges: A Discharge Map and Information on Erie County's Foremost Urban Quality Problem*, December 1999

Lake Erie and many of its tributaries remain impaired by pollutants originating from State Pollution Discharge Elimination System (SPDES) outfall points, combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs). CERI developed a map of Erie County identifying all state permitted sewage discharge points including industrial discharges, CSOs, SSOs, municipal and private discharges.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie County Department of Environment and Planning, *The Erie County Agricultural Pollution Prevention Experience*, December 1995

This is the final report for a 4.5-year grant with the goal of reducing non-point source pollution from agriculture practices through best management practices, technical outreach, education, and financial assistance.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County Department of Environment and Planning, *Draft Prioritizing Erie County Hazardous Waste Sites for Remediation Based on Future Use Potential*, December 1992

This report ranks 114 hazardous waste sites throughout the County as low, medium, or high priority based on redevelopment potential.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County Department of Health, *Erie County Beach Sanitary Survey Grant Project Summary Report (C-024966)*, May 2015

This report documents the grant that supported beach sanitary surveys in Erie County.

-Contact Erie County Health Department at (716) 961-6800 to view a copy

Erie County Environmental Management Council, *2016 Annual Recommendations Report*, July 2016

The State of the Environment annual report is a comprehensive look at the health of the County's natural environment. One of the report sections addresses water quality. It is prepared by the volunteer members of the Council with assistance from Division of Environmental Compliance Services staff in the Department of Environment & Planning.

<http://www2.erie.gov/environment/sites/www2.erie.gov/environment/files/uploads/2016%20State%20of%20Environment%20Final.pdf>

Erie County Laboratory-Public Health Division, *1973 Erie County Stream Survey*, March 1974

The objective of this Survey was the specific investigation of potential problem areas and how they affect stream quality. Other objectives included: determine if water samples were in violation of NYS standards and identify pollution sources, study and analyze industrial pollutants, and continue studying benthic organisms as they relate to stream quality.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie County Local Conservation Working Group, *Priority Area Assessment*, April 1997

The purpose of the report was to provide information to the NYS Technical Committee, the USDA NRCS and Farm Services Agency on critical water quality and erosion problems in Erie County. It summarizes county wide conditions for four priority watersheds: Eighteenmile, Cattaraugus, Buffalo and Ellicott Creeks.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie County Soil and Water Conservation District, *Agriculture Environmental Management Strategic Plan 2015-2020*, Revised 4/02/2015

This strategy to guide the AEM Program in Erie County was developed to demonstrate that AEM long term goals and objectives are being met, and that local resource concerns and agricultural issues are being addressed. The necessary administrative, technical and financial resources are identified to carry out the AEM. <http://www.ecswcd.org/docs/2015PlanFinal.pdf>

Erie County Water Quality Committee, *Erie County Water Quality Strategy*, January 2011

This document defines the structure and goals of the County Water Quality Committee that acts as an umbrella structure under which water quality issues affecting Erie County can be addressed.

<http://ecswcd.org/docs/2011%20Water%20Quality%20Strategy.pdf>

Federal Emergency Management Agency, *Flood Insurance Study-Erie County, NY, Volume I; Preliminary*, December 31, 2009

This countywide Flood Insurance Study investigates the existence and severity of flood hazards in Erie County or revises and updates previous flood studies. It has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information can be used to update existing flood plain regulations and to promote sound land use and development.

http://www.rampp-team.com/county_maps/new_york/erie/erie_ny_fis_tables1.pdf

Federal Emergency Management Agency, *Flood Insurance Study-City of Buffalo*, May 1981

This flood insurance study investigates the existence and severity of flood hazards in the City of Buffalo. The study was used to convert Buffalo to the regular program of flood insurance by the

Federal Insurance Administration. Local and regional planners can use this study in their efforts to promote sound flood plain management. This information was updated in the above study.

http://www.worldcat.org/title/flood-insurance-study-city-of-buffalo-new-york-erie-county/oclc/7988034&referer=brief_results

NYS Department of Health, *Buffalo Water Authority and Erie County Water Authority Source Water Assessment Program Reports*

These reports were completed under the NYS Department of Health's Source Water Assessment Program. The purpose of this program is to compile, organize, and evaluate information regarding possible and actual threats to the quality of public water supply sources. These reports do not address the safety or quality of treated finished potable tap water.

http://www.health.ny.gov/environmental/water/drinking/water_quality_report_links.htm

Poloncarz, Mark C. Erie County Executive, *Initiatives for a Smart Economy 2013*

This report outlines the County's key initiatives to revitalize the regional economy and focuses on land use, the workforce, international trade, tourism, agriculture, smart growth, energy, clean water, and the Erie County Industrial Development Agency. The report closes with a chapter on Western New York's "Blue Economy," and how to strategically utilize the Great Lakes and Niagara River for the best environmental and economic benefit.

<http://www2.erie.gov/environment/sites/www2.erie.gov.environment/files/uploads/pdfs/SmartEconomy%20for%20Web3.pdf>

USDA Soil Conservation Service, *Soil Survey of Erie County, New York, December 1986*

This survey categorizes and maps soils throughout the County from field work occurring 1966-1977.

https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_york/NY029/0/erie.pdf

Western New York Stormwater Coalition, *Stormwater Utility District Feasibility Study, 2010*

This feasibility study was funded by a DEC grant to the Western New York Stormwater Coalition and investigates the formation of an Stormwater Utility District (SUD) for Erie and Niagara Counties. Data was collected from communities in the counties and then interviews were held with the communities to discuss the data gathered. Overall, most communities were concerned with additional/increased costs, and 50% of the communities interviewed were not in favor of a complete takeover of their stormwater by an SUD. The conclusion of the feasibility study was that an SUD is feasible, but would best be undertaken by a separate entity. Ultimately, the public meetings showed that there was "no compelling need at this time" to embark on phase two.

http://www.stormwateralbanycounty.org/wp-content/uploads/2011/12/NYS_SWUtilityDist_FeasStudy_Erie-NiagCnty_April2010_IncluAppA_B_C_E.pdf

GENESEE COUNTY

Cornell University, *Manure Management Guidelines for Limestone Bedrock/Karst Areas of Genesee County, New York: Practices for Risk Reduction*, 2011

This document outlines manure management practices for the karst area for Genesee County, NY. These risk reduction practices may also be effective in karst and other sensitive areas throughout New York State. While this guide is solely focused on agriculture, other activities and conditions in karst landscapes also pose an elevated risk for groundwater contamination.

http://nmisp.cals.cornell.edu/publications/files/Karst_2_15_2011.pdf

Genesee County, NY, *Water Quality Management Study*, August 1981

The report provides an update of the Genesee County Comprehensive Sewerage Study prepared in 1971. It analyzed existing wastewater problems in Genesee County communities and reviews current activities. Several possible alternative solutions and estimated costs are identified and a recommended residual waste management plan for the County is recommended.

https://books.google.com/books/about/Water_Quality_Management_Study_for_Genes.html?id=V9yctgAACAAJ

Genesee County Legislature, *Genesee County Comprehensive Plan-Executive Summary*, September 1997

This plan was prepared to articulate a common direction and vision for Genesee County and to improve coordination among the County and its local governments. The Plan focuses on issues that involve county funding or program administration and those that could benefit from intergovernmental cooperation. The nine focus areas did not include consideration of the County's natural resources. http://www.co.genesee.ny.us/docs/planning/GC_Comp_Plan.pdf

Genesee County Water Quality Coordinating Committee, *A Water Quality Strategy for Genesee County*, April 2015

In prioritizing water resource problems, the Committee agreed that municipal water supply sources will receive the highest priority. Based on this the Committee designated the following three areas as being high priority: Tonawanda Creek watershed, south of the City of Batavia; Batavia aquifer, Le Roy Reservoir.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Genesee County Water Resources Agency, *Genesee County Smart Growth Plan-2013 Review Report*

The Plan is intended to encourage the revitalization of villages and hamlet areas, and protect valuable agricultural resources. The Plan and accompanying action items requires the County to restrict hook-ups to County funded portions of the county water system. The boundaries of the development areas were drawn to exclude land within regulated wetlands and flood hazard areas.

http://www.co.genesee.ny.us/docs/planning/Genesee_County_Smart_Growth_Plan_2013_Update_Adopted.pdf

NIAGARA COUNTY

Federal Emergency Management Agency, *Flood Insurance Study-Niagara County, NY*, September 2008

This countywide Flood Insurance Study investigates the existence and severity of flood hazards in, or revises and updates previous flood studies for the geographic area of Niagara County, NY. This study has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information can be used to update existing flood plain regulations and to further promote sound land use and floodplain development.

http://wakeupniagara.weebly.com/uploads/7/2/3/7/7237922/niagara_ny_fis_tables1.pdf

Niagara County, NY; *Niagara Communities Comprehensive Plan 2030*, July 2009

Niagara County's first comprehensive plan emphasizes a multi-municipal approach to planning and informed decision making. The purpose of the Plan is to provide a framework for achieving five high priority goals: encouraging desirable and appropriate growth and development, strengthening the local economy, improving the delivery of services, prioritizing and coordinating capital improvements, and improving the quality of life for county residents. Management of water resources, air quality, wildlife habitats, unique natural features and important scenic resources is also on the list of priority issues. Maintaining and enhancing green infrastructure that includes existing natural systems and ecological functions is a way to lessen the physical stress and associated costs of maintaining gray infrastructure.

http://www.niagaracounty.com/Portals/0/docs/NCCompPlan/Final_NiagCommCompPlan.pdf

Niagara County, NY, *Water Quality Strategy*, 1992

The Niagara County Water Quality Strategy was completed in 1992. The strategy identified various pollutants, their source and the level of concern for each pollutant. Those receiving a high ranking include: toxic substances from municipal/industrial waste, urban runoff, landfill leachate, agricultural runoff; and sediment from construction site runoff, agriculture, and erosion. The following Niagara watershed waterways were listed as a high priority: Sawyer and Donner Creeks.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Niagara County Soil & Water Conservation District and SUNY Brockport, *Characterization and Prioritization of Niagara County Watersheds*, June 2008

The report is a summary of water samples taken from Niagara County waterways from February 2006 through December 2007. Tonawanda and Bergholtz Creeks had a significantly higher phosphorus loss than other county watersheds. Bergholtz Creek had the highest concentrations of total phosphorus, total suspended solids, and total kjeldahl nitrogen. Bergholtz and Tonawanda Creeks were recommended for identification of point and non-point pollution sources.

http://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1007&context=tech_rep

Niagara County Soil & Water Conservation District (SWCD), *Agricultural Environmental Management Program Strategic Plan*

In February 2006 the Niagara County SWCD and SUNY Brockport began a two-year survey of 17 Niagara County streams. Tonawanda Creek had one of the largest nitrate losses from its watershed. Tonawanda and Bergholtz Creeks ranked the highest in total suspended solids. Tonawanda and

Bergholtz Creeks had some of the highest total kjeldahl nitrogen loss. In 2004 the Niagara County Water Quality Coordinating Committee released a report that listed Tonawanda Creek as a priority because of a threat to fish propagation and survival, and stream bank erosion as a major cause of water quality impairments. SMART goals and objectives include: eliminate stream sedimentation issues caused by farming operations, and minimize the impacts of fertilizers and pesticides.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

WYOMING COUNTY

Wyoming County Water Resources Coordinating Committee, *Wyoming County Water Quality Strategy-Seventh Edition*, January 2011

This edition is an updated, revised version of the 2004 water quality strategy. The strategy outlines the committee's purpose, priority waterbodies and watersheds throughout the county and future goals. http://www.wcswcd.org/images/uploads/Wyoming_County_Water_Quality_Strategy.pdf

Wyoming County Board of Supervisors, *Target Tomorrow*, 2001

This report on the county's economic development strategy identified the following five key areas and recommended a series of actions to be taken to strengthen the county's economy. These key areas were: business development, infrastructure, agriculture, rural resource management, and tourism.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NIAGARA RIVER/ LAKE ERIE WATERSHED

These reports cover portions of the greater Niagara River/Lake Erie watershed and do not fall into one particular sub-watershed.

Buffalo Niagara Riverkeeper, *Buffalo and Niagara Rivers Habitat Assessment and Conservation Framework*, November 2008.

In 2007-2008, Buffalo Niagara Riverkeeper undertook a project to improve the overall understanding of habitat conditions in the Buffalo and Niagara River Areas of Concern (AOCs) and their tributary areas in order to develop a solid framework of goals, benchmarks and delisting criteria to guide future conservation efforts. Working with a GIS specialist and a Technical Advisory Group of expert stakeholders, existing data pertaining to fish and wildlife habitat in the river corridors was reviewed and synthesized. Reference conditions are described by analyzing historical maps and documents, baseline Remedial Action Plan inventories, and a variety of Great Lakes models for evaluating habitat integrity. Current conditions are described using aerial images, maps, databases, field reports, and information provided by the Technical Advisory Group and other habitat experts. On the basis of this research, this report provides the following:

- ❖ For both AOCs: an assessment of existing habitat conditions, opportunity areas, information needs, and major accomplishments and challenges since the baseline RAP inventories;
- ❖ For the Buffalo River AOC: specific habitat conservation goals and delisting criteria (adopted by the Buffalo River Remedial Action Committee in November, 2008);

- ❖ For the Buffalo River study area upstream of the AOC: conservation goals, strategies and benchmarks;
- ❖ For the Niagara River AOC: generalized habitat conservation goals and delisting criteria (generally adopted by the Niagara River Remedial Advisory Committee in December, 2008); and
- ❖ For the Niagara River Watershed and its sub-watersheds: a beginning measure of current amounts of habitat by type, and identification of large-scale conservation opportunity areas.

Beyond the Remedial Action Planning context, this report is intended for use as a basic reference and guide for anyone interested in restoring and conserving the biological health of the Buffalo and Niagara River corridors and tributary areas. Researchers will find both in the collected information and the identified gaps, a resource for continuing to build an integrated knowledge base of local riverine habitats and species. Local governments and their constituents should be able to supplement what they already know about land uses in the Buffalo and Niagara River bioregion with ecological knowledge, and thus become better managers of the living systems under their jurisdiction.

http://www.dec.ny.gov/docs/regions_pdf/bnrhabreport.pdf

Buffalo Niagara Riverkeeper, *Green Infrastructure Solutions to Buffalo's Sewer Overflow Challenge*, March 2011

This report examines the potential for reducing sewer overflow events and stormwater pollution within the Buffalo Sewer Authority system through the use of green infrastructure.

http://bnriverkeeper.org/wp-content/uploads/2011/04/BSAReport_Final_REV_4.11.11_LR_1.pdf

Buffalo Niagara Riverkeeper, *Niagara River Greenway Habitat Conservation Strategy*, July 2015

This is a companion to the *Niagara River Habitat Conservation Strategy* and provides detailed habitat restoration and conservation opportunities for the Niagara River Greenway portion of the watershed. It includes an analysis of fish barriers, an assessment of shoreline conditions, data collection regarding seeps within the Niagara River Gorge, completion of stream assessments along 13+ miles of stream, and gathering of public input on priorities and threats from stakeholder meetings. It also includes a one-foot-resolution land cover mapping database for the coastal areas in the Greenway.

<http://bnriverkeeper.org/2011/05/habitatstrategy>

Buffalo Niagara Riverkeeper, *Niagara River Habitat Conservation Strategy*, 2014

This document identifies critical habitats and priority actions for the 900,000+ acre Niagara River watershed. Funding for this effort was provided by the 2010 US Environmental Protection Agency's Great Lakes Restoration Initiative. The completed document serves as a regional blueprint for habitat restoration and conservation, identifying best-bet opportunities to positively impact water quality. A major priority action identified in the final document focuses on the protection of headwater forests along with the first and second order streams they nurture.

<http://bnriverkeeper.org/habitatstrategy/>

Chautauqua County Department of Health Division of Environmental Health Services, *Municipal Water Supply Needs Assessment Part I: Northern Chautauqua County*, August 2008.

This includes detailed assessments of the water supply systems, treatment plants, storage systems, and distribution systems for the municipalities in the northern portion of the county along Lake Erie. Cost estimates are provided for necessary improvements.

<http://chautauqua.ny.us/ArchiveCenter/ViewFile/Item/136>

Erie-Niagara Basin Regional Water Resources Planning Board, *Erie-Niagara Basin Surface Water*, 1968

The US Geological Survey evaluated stream flow in the Erie-Niagara basin and also analyzed precipitation, temperature, and evaporation data from the US Weather Bureau to relate the data to area hydrologic characteristics. <https://pubs.er.usgs.gov/publication/70040604>

Erie-Niagara Basin Regional Water Resources Planning Board, *Erie-Niagara Basin Ground Water Resources*, 1968

This report presents the results of an investigation by the US Geological Survey conducted for the Erie-Niagara Basin Regional Water Resources Planning Board. The study area extends from the Cattaraugus Creek basin to the Tonawanda Creek basin and includes Grand Island. The Geological Survey provided an evaluation of the ground water resources of the Erie-Niagara basin and a description of the geology needed for broad planning of water resources development. Evaluation of the ground water resources included appraising the quantity and quality of water available for development, its areal distribution, and seasonal variations. Existing and potential pollution and their effect on the availability of ground water were also included.

<https://pubs.er.usgs.gov/publication/70040605>

Erie-Niagara Basin Regional Water Resources Planning Board, *Erie-Niagara Basin Comprehensive Water Resources Plan, Main Report*; December 1969

This report presents a comprehensive plan for water resources management and development in the Erie-Niagara Basin. The report identifies the available alternatives to meet the needs for municipal and industrial water supply, water quality management, irrigated agriculture, water-based recreation, fish and wildlife enhancement, flood plain management, and integrates these alternatives into a coordinated development program for the period 1970 to 2020.

https://books.google.com/books/about/Erie_Niagara_Basin_Comprehensive_Water_R.html?id=aTEknQEACAAJ

Erie-Niagara Basin Regional Water Resources Planning Board, *A Reconnaissance of Stream Sediment in the Erie-Niagara Basin*, 1968

This reconnaissance study of erosion and deposition of sediment in the Erie-Niagara basin indicates that the highest sediment yields occur in streams that drain upland areas. These estimates are believed to be indicative of the magnitude of sediment yields and provide a general description of stream sediment movement in the study area. <https://pubs.er.usgs.gov/publication/70040709>

Erie-Niagara Basin Regional Water Resources Planning Board, *Chemical Quality of Streams in the Erie-Niagara Basin*, 1968

The natural chemical quality of water in streams in most of the Erie-Niagara basin is good, and except for the lower Tonawanda Creek sub-watershed, little or no chemical quality treatment is needed for public water supply. Because of pollution the sanitary and chemical quality of some streams is poor, especially in the immediate Buffalo area and in downstream parts of several of the larger streams.

<https://pubs.er.usgs.gov/publication/70040708>

Erie-Niagara Basin Regional Water Resources Planning Board, *Surface Water in the Erie-Niagara Basin*, 1968

Area stream flow was evaluated and precipitation, temperature, and evaporation data was analyzed and related to the hydrologic characteristics of the area. Stream flow is highly variable throughout the year and also from place to place.

<https://pubs.er.usgs.gov/publication/70040604>

Erie and Niagara Counties Regional Planning Board, *208 Water Quality Management Program, Report 7 Water Quality Data, Stream Sampling and Modeling, Volume II and Volume III*; January 1979

The Volume II report describes the water quality and hydraulic calibrations done for modeling efforts on Eighteen Mile Creek, Tonawanda Creek, Ellicott Creek, Big Sister Creek and the Black Rock Canal. Calibrations were conducted using water quality and flow data collected as part of 208 sampling efforts.

The Volume III report found that combined sewer overflow discharges were found to have significant water quality impacts on Eighteen Mile Creek, Scajaquada Creek and the Black Rock Canal and necessary abatement requirements were recommended. Discharges to the Buffalo River were found to be substantial, but did not exceed dissolved oxygen stream standards. Urban and rural runoff were found to have insignificant impact on in-stream dissolved oxygen concentrations and in many cases help improve concentrations by flushing normally stagnant, low flow streams.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Open Space*, June 1969

A study of parks, recreation and open space, and an inventory and analysis of existing data. Said that the Erie-Niagara region is deficient in water related recreation facilities. There is relatively little water frontage in public ownership and the quality of our water resources is declining as a result of serious pollution problems. http://www.worldcat.org/title/open-space-parks-recreation-and-open-space-study-an-inventory-and-analysis-of-existing-data-erie-niagara-counties/oclc/80942908&referer=brief_results

Erie and Niagara Counties Regional Planning Board, *Open Space Preservation Plan for Niagara Escarpment*, December 1972

This report proposes the management and preservation of the scenic qualities of the Niagara Escarpment in an area extending from the Niagara River to the City of Lockport. Concept plans focus on preservation of the scenic natural qualities of the escarpment and use of existing public open space for development as activity centers.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Parks, Recreation and Open Space Study and Plan*, August 1969

The purpose of this study was to examine the region's existing parks, recreation and open space system and to develop short and long range plans. Four principal goals were established to provide study focus and direction: preservation of high quality resources, provision of areas of urban relief, reduction of potential flooding damages, and provision of outdoor recreation opportunities. The most significant of all regionally significant natural resources within the bi-county area are its lakes and

watercourses, Principal attention is on the Great Lakes, Niagara River, and those streams with a significant sustained flow.

<https://www.buffalolib.org/vufind/Record/157384>

Erie and Niagara Counties Regional Planning Board, *Regional Recreation Implementation Study and Plan*, September 1971

Contains specific proposals for implementing a linear recreation and open space corridor concept along Gill and Cayuga Creeks in Niagara County, and Ellicott and Cazenovia Creeks in Erie County. Analyzes regional open space and recreation plans, needs, deficiencies, and environmental factors. Each proposed concept plan, implementing agency, and cost is defined. Appendices analyze funding sources, and regulations that can be used for implementing concept plans are reviewed.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Federal Emergency Management Agency, *Flood Insurance Study-City of Buffalo*, May 1981

This flood insurance study investigates the existence and severity of flood hazards in the City of Buffalo. The study was used to convert Buffalo to the regular program of flood insurance by the Federal Insurance Administration. Local and regional planners can use this study in their efforts to promote sound flood plain management.

http://www.worldcat.org/title/flood-insurance-study-city-of-buffalo-new-york-erie-county/oclc/7988034&referer=brief_results

Great Lakes Fishery Commission-Environmental Objectives Sub-Committee, *Lake Erie Environmental Objectives*, July 2005

Environmental objectives are intended to outline issues or conditions necessary to achieving habitat conditions that are important to achieving the Lake Erie Committee's fish community goals and objectives. Ten environmental objectives were identified to address achievement of the thirteen fish community goals and objectives. Restoration of natural physical processes to the extent possible will promote recovery or recreation of a more natural habitat mosaic and further allow the Lake Erie fish community to adapt to forecasted declines in water levels.

http://www.glfc.org/lakecom/lec/LEC_docs/other_docs/EOs_July5.pdf

Great Lakes Fishery Commission, *The State of Lake Erie in 2004*

In this first state-of-the-lake report for Lake Erie, progress from 1999 to 2003 toward achievement of the fish community goals and objectives established in 2003 is gauged. The report concludes that the state of Lake Erie is improving in some areas. http://www.glfc.org/pubs/SpecialPubs/Sp09_2.pdf

Irvine, Kim and Buffalo State College Department of Geography and Planning; *Synthesis/Mapping Environmental Data of Niagara River Tributaries*, 2006

In 2003, EPA provided grant funding to collect, organize, and digitize sediment, water, and biological data related to the Niagara River and its tributaries for the period 1979 to 2005. The primary focus is on the 18 priority toxic contaminants identified by the Niagara River Toxics Management Plan. This work documents past and current environmental conditions, and the identification of potential priority areas for future investigations.

The data bases are categorized as: river sediment, sediment elutriate, sewer sediment, sewer and stormwater runoff, surface water, and biota. The study did not include groundwater/well monitoring results, surface soil sample results, or permitted direct discharges.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

New York Natural Heritage Program, *Lake Erie Gorges Biodiversity Inventory & Landscape Integrity Analysis*, October 15, 2002

This report was funded by the Central/Western New York Chapter of the Nature Conservancy to survey and document significant natural communities and rare species in several of the forested gorges located in Chautauqua, Cattaraugus, and Erie counties flowing into Lake Erie.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

NYS Department of Environmental Conservation, *Lake Erie 2016 Annual Report to the Lake Erie Committee and the Great Lakes Fishery Commission*, March 2017

This report describes the status of various fisheries within the eastern basin of Lake Erie.

<http://www.dec.ny.gov/outdoor/32286.html>

NYS Department of Environmental Conservation, *PCBs and Organochlorine Pesticide Residues in Young-of-Year Fish from New and Traditional Nearshore Sampling areas in the Western Portion of New York State's Great Lakes Basin*, 2009; January 2011

In September 2009, 144 young-of-year fish composites were collected from near-shore areas within the western portion of New York State's Great Lakes Basin for polychlorinated biphenyl (PCB) and organochlorine (OC) pesticide residue monitoring. Some of the most PCB contaminated of the 20 sites tested are: Gill Creek at Buffalo Avenue, Twomile Creek, Gratwick-Riverside Park and upstream Bergholtz Creek. Four other sampling locations including Cayuga Creek, Niagara County at Lindberg Avenue and Porter Road, and the upstream and downstream Little Niagara River, exceeded the non-detect Mirex objective designed to protect piscivorous wildlife. Recommendations are presented for sites needing additional remediation.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYS Department of Environmental Conservation, Division of Water, *The Niagara River-Lake Erie Drainage Basin, Sampling Years 2000-2001*, February 2005

In 2000 and 2001, the rivers and streams of the Niagara River-Lake Erie basin were sampled as part of the Rotating Integrated Basin Studies portion (RIBS) of the statewide waters monitoring program. Results obtained through this water quality monitoring are contained in this report. The RIBS program objectives are to provide: an assessment of the water quality of the states waterways with a comprehensive and integrated multi-media sampling program, analysis of long term water quality trends, characterization of naturally occurring or background conditions, and the establishment of baseline conditions for measuring the effectiveness of site specific restoration and protection activities.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYS Department of Environmental Conservation (NYS DEC), Division of Water, *The Niagara River/Lake Erie Basin Waterbody Inventory and Priority Waterbodies List*, September 2010

The NYS DEC provides regular periodic assessments of the quality of state water resources and their ability to support specific uses. These assessments reflect monitoring and water quality information drawn from a number of programs and sources. The water body inventory database is used to record current water quality information, characterize known and/or suspected water quality problems and issues, and track progress toward their resolution.

http://www.dec.ny.gov/docs/water_pdf/pwlniag10.pdf

NYS Department of Environmental Conservation, Division of Water, *The 2002 Niagara River/Lake Erie Basin Waterbody Inventory and Priority Waterbodies List*, July 2003

To fulfill certain requirements of the Federal Clean Water Act, the NYS DEC must provide regular, periodic assessments of water resource quality. This information has been compiled into an inventory database of all New York State waterbodies that is used to record current water quality information, characterize known and/or suspected water quality problems and issues, and track progress toward their resolution.

http://bnriverkeeper.org/wp-content/uploads/2009/07/23-2002_Priority-Waterbodies-List.pdf

NYS Department of Environmental Conservation, Division of Water, *Niagara River Lake Erie Drainage Basin, Sampling Years 2005-2006*, May 2011

In 2005 and 2006, the rivers and streams of the Niagara River-Lake Erie basin were sampled as part of the Rotating Integrated Basin Studies (RIBS) portion of the statewide waters monitoring program. Results obtained through this water quality monitoring are contained in this report. The RIBS program objectives are to provide: an assessment of the water quality of the states waterways with a comprehensive and integrated multi-media sampling program, analysis of long term water quality trends, characterization of naturally occurring or background conditions, and the establishment of baseline conditions for measuring the effectiveness of site specific restoration and protection activities.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYS Department of Environmental Conservation Division of Water; *Nonpoint Source Assessment Report*, February 1989

This assessment report reflects the current level of understanding of nonpoint source problems in New York State. The report discusses the nature of nonpoint sources, and identifies waterbodies including the Lake Erie-Niagara River drainage basin, that are adversely impacted by nonpoint sources.

http://www.worldcat.org/title/nonpoint-source-assessment-report/oclc/32191497&referer=brief_results

NYS Department of Environmental Conservation, Division of Water, Bureau of Water Resources, *A Erie-Niagara Region-Water Resources Management Strategy*, January 1989

Contains information, findings and recommendations regarding the following topic areas: water quantity, quality, infrastructure, system management, and data and research.

https://books.google.com/books/about/Erie_Niagara_Region_Water_Resources_Management_Strategy.html?id=F721twAACA-AJ

U.S. Army Corps of Engineers Buffalo District, *Draft Niagara River, NY Initial Watershed Assessment*, September, 2010

This initial watershed assessment documents the results of a preliminary assessment of watershed problems, needs and opportunities in the Niagara River watershed. Two stakeholder workshops were held to elicit concerns and opportunities as viewed by the stakeholders, agencies and residents of the watershed. Numerous concerns and opportunities were expressed including habitat and invasive species, water quality issues, land use, Great Lakes water diversion, dredging and sedimentation.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

USDA Natural Resources Conservation Service, *New York Rapid Watershed Assessment Profile: Buffalo-Eighteenmile Watershed*, April 2009

Provides summary information and maps for a watershed that includes the following sub-watersheds: Eighteenmile Creek, Smokes Creek, Buffalo Creek, Cayuga Creek, and the Buffalo River.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/dma/rwa/?cid=stelprdb1246971>

USDA Natural Resources Conservation Service, *New York Rapid Watershed Assessment Profile: Cattaraugus Watershed*, May 2009

Provides summary information and maps for a watershed that includes the following sub-watersheds: Headwaters Cattaraugus Creek and Cattaraugus Creek.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/dma/rwa/?cid=stelprdb1246971>

USDA Natural Resources Conservation Service, *New York Rapid Watershed Assessment Profile: Chautauqua-Conneaut Watershed*, February 2010

Provides summary information and maps for a watershed that includes the following sub-watersheds: Six mile Creek, Chautauqua Creek, Canadaway Creek, and Walnut Creek.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/dma/rwa/?cid=stelprdb1246971>

USDA Natural Resources Conservation Service, *New York Rapid Watershed Assessment Profile: Niagara Watershed*, October 2009

The report contains summary information and maps for the Niagara River watershed area that includes the following sub-watersheds: Niagara River, Upper Tonawanda Creek, Middle Tonawanda Creek, Lower Tonawanda Creek, Ellicott Creek, and Murder Creek.

<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/technical/dma/rwa/?cid=stelprdb1246990>

U.S. Geological Survey, *Geology and Hydrology of the Onondaga Aquifer in Eastern Erie County, New York*, 1987

In October 1983, the US Geological Survey began a two-year study to describe the hydrologic conditions in the Onondaga aquifer in eastern Erie County, and to identify the extent and cause of ground water level declines and increased sinkhole formation. This report summarizes results of the study that describe the hydrologic conditions in the Onondaga aquifer from October 1982 through September 1985 and explains the probable cause of water level declines and the processes and causes of sink hole formation in the area. It also presents physiographic and water level maps, hydrographs, water quality data, and a geologic section of rock units in the Newstead and Clarence study area.

<http://pubs.usgs.gov/wri/1986/4317/report.pdf>

U.S. Geological Survey, *Potential Yields of Wells in Unconsolidated Aquifers in Upstate New York-Niagara Sheet*, 1988

This map is one in a series of five that show the distribution of unconsolidated aquifers in upstate New York. The maps also indicate the parts of these aquifers that are heavily used for public water supplies and have been designated as primary water supply aquifers by the NYS Department of Environmental Conservation.

<http://babel.hathitrust.org/cgi/pt?id=mdp.39015027833352;view=1up;seq=1>

U.S. Geological Survey, *Hydrogeologic Appraisal of Five Selected Aquifers in Erie County, NY*; 1985

Hydrogeologic conditions and water quality within four unconsolidated glacial aquifers and a bedrock aquifer were investigated during 1981-83. The aquifers are in suburban areas of Buffalo, and in major valleys in Erie County where development is increasing rapidly. The studied aquifers were in the Clarence-Lancaster-Newstead, Sardinia, Springville, and Alden areas.

<http://pubs.usgs.gov/wri/1984/4334/report.pdf>

U. S. Geological Survey, *Water Resources Data New York Water Year 1996 Volume 3 Western New York, June 1997*

Results of stage, discharge, and water quality sampling at gaging stations for western New York State is included in this volume. Charts are included showing trends for areas where multiple years of data are available.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Western New York Land Conservancy, *Niagara Escarpment Legacy Project*, May 2014

The Project was prepared by Ecology & Environment and paints a detailed portrait of the escarpment from scientific and historical perspectives, using both quantitative and qualitative analysis. It sets goals for the conservation, restoration, and future stewardship of this unique landscape, including the identification of specific properties that will be considered for future preservation.

<https://wnylc.org/site/wp-content/uploads/2014/05/Report-Niagara-Escarpment-Legacy-Project-May-2014.pdf>

BIG SISTER CREEK SUB-WATERSHED

Erie County Health Department, *Final Report Erie County, NY Lake Erie Stream Sanitary Surveys Project (GL-97219100)*, January 2015

This report discusses the findings of beach sanitary surveys at Lake Erie Beach, Evans Town Beach, Bennett Beach, Wendt Beach, Hamburg Town Beach, and Woodlawn Beach. Sampling was also conducted in the following streams: Muddy Creek, Delaware Creek, Big Sister Creek, Little Sister Creek, and Berricks Creek.

-Contact Erie County Health Department at (716) 961-6800

Seven Creeks Watershed Task Force and SUNY Buffalo School of Architecture and Planning, *Local Guide to Water Resource Management In New York State*, 1989.

The guide was developed as part of the Seven Creeks Watershed project, whose purpose was to help local watershed communities by providing information tools that could be used to conserve natural resources, and to deal with problems such as poor drainage, flooding, erosion, and surface and groundwater pollution. <https://www.buffalolib.org/vufind/Record/598830>

Wendel, *Town of Evans Local Waterfront Revitalization Program Amendment*, October 2011

The waterfront area of Evans is broken down into sections describing current conditions and plans for the future. Natural resources are discussed, including beaches, and suggestions are given for protecting wetlands and other natural areas. <http://www.townofevans.org/docs/local-waterfront-revitalization.html>

U. S. Army Corps of Engineers Buffalo District, *Special Flood Hazard Evaluation Report, Big Sister Creek, Village of Angola, Erie County, New York*, November 1997.

This is an investigation of the potential flood situation along Big Sister Creek in the Village of Angola.
-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U. S. Army Corps of Engineers Buffalo District, *Reconnaissance Report on Big Sister Creek, New York for Flood Control Under Section 205*, January 1966

This report explored the feasibility of improving Big Sister Creek for flood control in the Town of Evans near the mouth of the creek.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

BUFFALO CREEK SUB-WATERSHED

Erie County Soil & Water Conservation District, *Comments-Buffalo Creek Watershed Protection Project*, February 1972

This provides a summary of essential project background information and maps of the treated area.
-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie-Niagara Basin Regional Water Resources Planning and Development Board, *Flood Plain Information, Buffalo Creek in The Towns of Elma and West Seneca*, April 1966

The report provides technical information on the magnitude and frequency of possible future flooding along Buffalo Creek. It also provides data as a basis for flood plain regulations.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Friends of the Buffalo River, *Buffalo and Cayuga Creeks Corridor Restoration Study: Final Report*, September 1997

The report studies the feasibility of extending the ongoing Buffalo River Greenway planning effort to include Buffalo and Cayuga Creeks in the towns of West Seneca and Cheektowaga. It focuses on lands adjacent to these creeks, with an emphasis on the area's cultural heritage and its functions as a wildlife corridor, and explores the feasibility for implementing a continuous riparian greenbelt.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Management Planning Assistance for Buffalo Creek, West Seneca, NY*; September 1979

The reports purpose was to provide planning assistance to the Town of West Seneca by identifying and evaluating flood damage reduction measures that will meet the Town's goals. The report provides information that can be used for present situations and for developing sound flood plain management goals for the future. A further objective was to determine if there is a federal interest in implementing any of the recommended alternatives.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

BUFFALO RIVER SUB-WATERSHED

Buffalo River Great Lakes Legacy Act Project Coordination Team, *Final Feasibility Study for the Buffalo River NY*, October 2011

Prepared by ENVIRON International Corporation, MACTEC Engineering & Consulting, Inc., and LimnoTech, this report builds on the sediment investigations, historic information, and information presented in the *Sediment Remedial Investigation Report for the Buffalo River*, which relies on the analyses of hydrological, ecological, and sediment conditions within the Buffalo River to support the evaluation of potential remedial measures. This report also identifies remedial action objectives, considers the range of available remediation technologies, evaluates those technologies for remediation of sediments, and compares remediation alternatives to help identify a preferred remedy for sediments in the Buffalo River AOC.

http://www.dec.ny.gov/docs/regions_pdf/brivfs.pdf

Buffalo Niagara Riverkeeper, *Buffalo River AOC Terrestrial Vertebrate Wildlife Survey*, 2013

This habitat assessment was developed to provide a baseline assessment of the abundance and distribution of three vertebrate faunal assemblages (herpetofauna, avifauna, and mammals.) Using a detailed survey methodology, this assessment gives a comprehensive habitat characterization, along with individual vertebrate characterizations and overall recommendations.

http://bnriverkeeper.org/wp-content/uploads/2013/04/BNR_FINAL_WILDLIFE_2012_Report-Body.pdf

Buffalo Niagara Riverkeeper, *Buffalo River Greenway-Vision & Implementation Plan*, May 2006

The Greenway Plan was developed to illustrate how a Greenway can benefit local residents and businesses adjacent to the Buffalo River, and Cayuga, Buffalo, and Cazenovia Creeks; and as a tool for lawmakers and decision makers to see how the Greenway can be constructed and completed.

<http://bnriverkeeper.org/wp-content/uploads/2011/11/Buffalo-River-Greenway-Vision-and-Implementation-Plan.pdf>

Buffalo Niagara Riverkeeper, *Protecting West Seneca's Natural Heritage: Creek Corridor Conservation in the Buffalo River Watershed*, March 2010

This brochure characterizes the land, water, geology, plants, animals, and history of the watershed. It is intended for West Seneca residents and includes stewardship ideas.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

City of Buffalo, *Buffalo Waterfront Plan: Local Waterfront Revitalization Plan DRAFT*, June 2014

The City of Buffalo Office of Strategic Planning has put together a framework for land along the Niagara River, Buffalo River, and Scajaquada Creek to, “safeguard the City’s natural water resources; water based economic development; and community interests.” Projects are listed to establish those goals.

http://www.buffalogreencode.com/LWRP/BuffaloLWRPDocument_Whole.pdf

City of Buffalo, NYS Department of Transportation, and US Department of Transportation Federal Highway Administration; *Queen City Waterfront, Final report for the Buffalo Corridor Management Plan*, April 2007

This plan was developed with the City of Buffalo Local Waterfront Revitalization Program (LWRP) as a complementary implementation guide reinforcing LWRP policies. It contains a comprehensive summary and review of recently completed, ongoing, planned, and hoped for waterfront projects in the City of Buffalo. The report also contains more detailed work on waterfront areas that were not previously addressed in previous planning reports. It presents aspirations through vision, policy, projects, designs, and a framework for setting waterfront priorities and managing implementation.

http://urbandesignproject.ap.buffalo.edu/projects/wci/QCW_Volume1_Strategy.pdf

D.E. Sauer, Buffalo Color Corporation; *An Environmental History of the Buffalo River*, 1979

The purpose of this study was to catalogue the interaction through time between man and the Buffalo River. It includes a time series of pollution loadings for ten pollutant parameters.

http://www.bnriverkeeper.org/wp-content/08-Sauer%201979_EnvHistoryBR.pdf

Diggins, Thomas P. and Randal J. Snyder, *Three Decades of Change in the Benthic Macroinvertebrate Community and Water Quality in the Buffalo River Area of Concern, 1964–1993*, 2003

This is a historical review of 18 independent benthic macroinvertebrate and water quality studies of the Buffalo River, New York, Area of Concern, revealing dramatic changes between 1964 and 1993.

<http://bnriverkeeper.org/wp-content/uploads/2009/07/Diggins-and-Snyder-20031.pdf>

Diggins, Thomas P. and Kenton M. Stewart, *Chironomid Deformities, Benthic Community Composition, and Trace Elements in the Buffalo River (New York) Area of Concern*, 1998

This study shows that more detailed metrics (e.g., taxonomically detailed chironomid data, Chironomus mouthpart deformity frequencies) provide additional information on community health that justifies the extra effort required for their assessment as measured at 15 sites along the Buffalo River.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County with State of New York Water Resources Commission and Department of Public Works, *Flood Plain Information Cazenovia Creek, NY in the city of Buffalo and Town of West Seneca*, October 1966

This is a record of the frequency and magnitude of flooding along Cazenovia Creek. It includes flood maps, high water elevations, and diagrams of flood-proofed structures.

[http://acwc.sdp.sirsi.net/client/en_US/default/search/detailnonmodal/ent:\\$002f\\$002fSD_ILS\\$002f0\\$002fSD_ILS:197092/ada/?rt=CKEY%7C%7C%7CCKEY%7C%7C%7Cfalse](http://acwc.sdp.sirsi.net/client/en_US/default/search/detailnonmodal/ent:$002f$002fSD_ILS$002f0$002fSD_ILS:197092/ada/?rt=CKEY%7C%7C%7CCKEY%7C%7C%7Cfalse)

Erie County Department of Environment and Planning, *The Buffalo River Combined Sewer Overflow Pollution Prevention Project*, date unknown

This report details a demonstration project from a grant received in 1995 to monitor wet weather and dry weather flows at two locations in the Babcock Street sewershed in Buffalo, NY. Outreach was conducted to businesses in the area to prevent pollution. This report is a partner report to the Erie County Department of Environment and Planning report, “*Sewer and Industrial Effluent Sampling in Support of the Buffalo River Combined Sewer Overflow Pollution Prevention Project.*”

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County Department of Environment and Planning, *Cazenovia Creek Pilot Watershed Management Project: Phase III Report-Application of Geo-Wams to the Cazenovia Creek Watershed*, May 1998

The Cazenovia Creek sub-watershed program involved a multi-phased approach that Erie County was guiding the eleven involved municipalities in identifying, quantifying, and prioritizing pollution sources within the sub-watershed, and developing strategies to reduce or eliminate these sources. This report presents the results of a contract with the University at Buffalo to quantify sources of pollutant loading as a function of land use by developing and applying a GIS based watershed loading model. The used model was also intended to be used to evaluate load reduction options for meeting water quality criteria in Cazenovia Creek, thereby assisting in the identification of pollution prevention measures that would generate water quality benefits.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County Department of Environment and Planning, *Cazenovia Creek Watershed Management Program: Baseline Water Quality Analysis, 1996; May 1997*

Water samples were collected during four storm events and tow inter-events at 12 sites on Cazenovia Creek. The samples were analyzed for 25 water quality parameters. While water quality in the creek is generally good, there is a decline in water quality moving from upstream rural areas to downstream urban impacted areas.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Erie County Department of Environment and Planning, *Fish and Wildlife Habitat Restoration on the Buffalo River NY*, August 1994

This document addresses the recommendation in the 1989 Buffalo River Remedial Action Plan that a fish and wildlife habitat restoration plan be developed. Habitat restoration opportunities were identified and evaluated. Five potential sites were reviewed and received unanimous support from the steering committee.

http://www.worldcat.org/title/fish-and-wildlife-habitat-restoration-on-the-buffalo-river-buffalo-new-york/oclc/670436139&referer=brief_results

Erie County Department of Environment and Planning, *Sewer and Industrial Effluent Sampling in Support of the Buffalo River Combined Sewer Overflow Pollution Prevention Project*, July 1999

This report details the results of water quality sampling conducted by Buffalo State in conjunction with the Buffalo Sewer Authority in the Buffalo River from 1996-1998.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Federal Emergency Management Agency, *Flood Insurance Study-City of Buffalo*, May 1981

This flood insurance study investigates the existence and severity of flood hazards in the City of Buffalo. The study was used to convert Buffalo to the regular program of flood insurance by the Federal Insurance Administration. Local and regional planners can use this study in their efforts to promote sound flood plain management.

http://www.worldcat.org/title/flood-insurance-study-city-of-buffalo-new-york-erie-county/oclc/7988034&referer=brief_results

Friends of the Buffalo River, *Buffalo River Greenway Study*, December 1994

This report summarizes three years of Buffalo River Greenway planning by the Friends of the Buffalo River Greenway Committee. A schematic land use plan was developed as a 50-year plan to provide a greenway vision for the Buffalo River.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Friends of the Buffalo River, *Buffalo River Greenway Plan and Design Guidelines*, 1996

The policies, guidelines, opportunities and projects identified in this report comprise an initial implementation strategy for the Buffalo River Greenway Plan. The focus is on local policies and projects that can be implemented now.

http://bnriverkeeper.org/wp-content/BufferoRiverGreenway_1996.pdf

Great Lakes Center for Environmental Research and Education, SUNY College at Buffalo; *DRAFT Field and Laboratory and Support Results Buffalo River Mass Balance Project*, February 1994

Summarizes the field and analytical methods used to determine target pollutant levels, the pollutant levels found in river and combined sewer samples, and provides preliminary interpretation of results and trends.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Great Lakes Center for Environmental Research and Education, SUNY College at Buffalo; *Levels and Sources of Indicator Bacteria Associated with the Buffalo River Area of Concern*, May 1994

Several research groups have begun to collect and analyze base line water and sediment quality data for the river and are providing estimates of pollutant and sediment dynamics within the Buffalo River AOC. The levels of numerous conventional parameters were evaluated in this research. The data, loading and fate estimates ultimately will aid in the selection of remediation strategies for the river.

<http://bnriverkeeper.org/wp-content/uploads/2009/07/PettiboneIrvine1996IndicatorBacteriaBuffaloRiver2.pdf>

The Great Lakes Research Consortium, *Controlling Land Use for Water Quality Protection: The Buffalo River Greenway Plan*, August 1993

The Buffalo River Greenway Plan was designed to demonstrate the feasibility of incorporating open space, recreational, and wildlife habitat areas into plans and strategies for revitalizing the Buffalo River corridor. The study seeks to realize a possible future vision that was described in the Remedial Action Plan for the Buffalo River.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Irvine, K., G. Stein, J. Singer, State University College at Buffalo; *An Environmental Guidebook to the Buffalo River*, 1990

This guidebook provides an introduction to the complex and unique Buffalo River environment, as well as a summary of current information on pollutant levels and sources. The first guidebook section describes the physical characteristics of the river, including the hydrology, channelization and lake effects. The second section briefly summarizes pollutant levels for Buffalo River water and sediment and identifies possible pollutant sources.

http://bnriverkeeper.org/wp-content/01-Irvine%20et%20al%201990_EnvGuidebook.pdf

Irvine, K., et al., *Contaminated Sediment in the Buffalo River AOC-Historical Trends and Current Conditions*, 2003

Contaminated sediment is an important issue for the Buffalo River AOC and this paper documents changes in the Buffalo River ecosystem as they pertain to temporal trends in sediment quality. Several completed studies provide a picture of sediment quality in the river.

<http://bnriverkeeper.org/wp-content/uploads/2009/07/Irvine-et-al-2003.pdf>

Irvine, K., et al, *Sampling and Modeling Approaches to Assess Water Quality Impacts of Combined Sewer Overflows (CSOs) – The Importance of a Watershed Perspective*, 2005

Consistent with other studies in this watershed, samples indicate that Buffalo City CSOs may contribute to the pollution in the Buffalo River, but upstream watershed sources may be a more important contribution to the Buffalo River pollution.

<http://geography.buffalostate.edu/sites/geography.buffalostate.edu/files/uploads/Documents/Irvine%20GGLR%202005.pdf>

NYS Department of Environmental Conservation, *Assessment of Potential Aquatic Habitat at Restoration Sites in the Buffalo River Area of Concern*, October 2005

The objective of this study was to document the biological, water quality, and use characteristics of 10 possible habitat restoration sites located between Michigan Avenue and the river's confluence with Cazenovia Creek. These data are a direct measure and update of biotic and limnological information for the river.

<http://bnriverkeeper.org/wp-content/uploads/2009/07/04-Irvine-et-al-2005-BR-PAHRS.pdf>

NYS Department of Environmental Conservation, *Fish and Wildlife Habitat Inventory and Assessment of the Lower Buffalo River Watershed*, October 1993

The projects goal was to complete the basic habitat inventory and assessment for the lower Buffalo River. Project objectives included: compile current and historic data on biological, physical, and chemical conditions; inventory current habitat types and populations and physical/chemical conditions; describe current fish and wildlife habitat limitations using historic and recent data

collections; and gain additional public input on the project in anticipation of future remedial measures. http://bnriverkeeper.org/wp-content/14-NYSDEC%201993_Fish&Wildlife.pdf

NYS Department of Environmental Conservation, *Buffalo River Remedial Action Plan*, November 1989

This report was prepared in response to a recommendation of the Water Quality Board of the International Joint Commission that Remedial Action Plans be prepared for the 42 Areas of Concern in the Great Lakes Basin. The goal of tAP is to restore and maintain the chemical, physical, and biological integrity of the Buffalo River ecosystem in accordance with the Great Lakes Water Quality Agreement.

RAP status update reports were prepared by NYS DEC and then Buffalo Niagara Riverkeeper, in 1990-93, 1995, 1999, 2002, 2005, and 2008.

http://www.dec.ny.gov/docs/water_pdf/buffalorapnov1989.pdf

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view copies of the annual reports from 1990-1993 in Room 1083.

The National Fish and Wildlife Foundation, *Bi-national Assessment of Marsh Habitat Quality*, January 2011

Monitoring relative population status and community structure of marsh birds and amphibians within the Great Lakes basin can help us evaluate how well marshes are functioning to maintain ecological integrity. The Marsh Monitoring Program is a bi-national marsh bird and amphibian monitoring program, coordinated by Bird Studies Canada and the U.S. Environmental Protection Agency. Since the program's inception in 1995, one of its primary objectives has been to contribute to the assessment and long term monitoring of Great Lakes Areas of Concern such as the Buffalo River AOC. http://www.dec.ny.gov/docs/regions_pdf/marshassess.pdf

Singer, J., et al; *Fish and Wildlife Assessment of the Buffalo River AOC and Watershed*, 1994

The report has three main sections: evaluation of siltation rates, biological surveys of fish and invertebrates, and physical characteristics of river bank and channel.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Buffalo River Area of Concern (AOC) Strategic Plan for Beneficial Use Impairment (BUI) Delisting*, March 2011

This report recommends a series of actions, projects, and programs to improve relevant conditions in the Buffalo River AOC and documents restoration and protection of beneficial uses in support of the eventual delisting or re-designation of this AOC.

<http://bnriverkeeper.org/wp-content/uploads/2009/07/Interim-Buffalo-River-Strategic-Plan-for-BUI-Delisting3.pdf>

U.S. Army Corps of Engineers Buffalo District, *Buffalo River NY RAP Investigation: Development of GIS Coverages*

The goal of this project was to assist with the development of a contaminated sediment remediation strategy for the Buffalo River AOC by organizing available sediment quality data reported between 1981 and 2003.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Buffalo River Section 312 Environmental Dredging Feasibility Study Status Report*, July 2010

This report documents the current status of the Section 312 study and details the current plan to remediate the Buffalo River under other programs and funding mechanisms. Through a number of planning efforts by federal agencies, with the support of numerous non-federal agencies and partners, the remediation cleanup of the Buffalo River will progress under two projects. The first phase will dredge approximately 450,000 cubic yards of sediment specifically within the federal navigation channel. Phase two will remediate contaminated sediments outside the federal navigation channel. This two phase plan will result in the cleanup of the majority of contaminated sediments in the Buffalo River and will assist in the delisting of the river as an Area of Concern.

http://www.worldcat.org/title/buffalo-river-section-312-environmental-dredging-feasibility-study-status-report/oclc/880146399&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Buffalo River Environmental Dredging Feasibility Study Appendix X-Geotechnical & Structural*, May 2008

Section 312 authority allows the Corps of Engineers to investigate and possibly implement dredging or other remediation measures outside and adjacent to the federal navigation channel. This structural/geotechnical appendix will attempt to categorize and provide feasibility report level discussion of the impacts of the large scale environmental dredging on the structures and shoreline along the Buffalo River.

http://www.worldcat.org/title/buffalo-river-environmental-dredging-feasibility-study-appendix-x-geotechnical-and-structural/oclc/880144733&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Volumes I & II: Sediment Sampling, Biological Analyses, and Chemical Analyses for Buffalo River Area of Concern*, Buffalo, NY; December 2003

The U.S. Army Corps of Engineers, Engineer Research and Development Center, Environmental Lab Chemistry Branch and Risk Assessment Branch, performed chemical and biological testing on sediment samples collected from the Buffalo River Area of Concern. Bed sediment textural analysis was done at the Buffalo State Soils Lab.

<http://www.worldcat.org/title/sediment-sampling-biological-analyses-and-chemical-analyses-for-buffalo-river-area-of-concern-buffalo-new-york/oclc/670433117>

U.S. Army Corps of Engineers Buffalo District, *Reconnaissance Study Section 312 (WRDA 90)-Buffalo River, NY Environmental Dredging*, December 2003

The results of this reconnaissance level investigation indicate that there are potential savings in future operation and maintenance, and the Friends of the Buffalo/Niagara Rivers is willing to cost share a feasibility study for the purpose of environmental restoration and water quality improvement. Further federal participation in detailed studies to determine if federal assistance in implementing environmental restoration dredging has been demonstrated. It was recommended that the Buffalo District proceed with the negotiation of a feasibility cost sharing agreement and detailed feasibility studies for a possible environmental restoration project on the Buffalo River.

http://www.worldcat.org/title/reconnaissance-study-section-312-wrda-90-buffalo-river-new-york-environmental-dredging/oclc/879875507&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Fish and Wildlife Habitat Inventory-Aquatic Macrophyte Survey of the Lower Buffalo River*, August 1998

The overall purpose of this study was to determine if the removal of contaminated sediments through environmental dredging would result in significant adverse or beneficial impacts on aquatic macrophyte beds, a critical habitat component already lacking in the lower Buffalo River. The survey determined their location and area.

http://www.worldcat.org/title/fish-and-wildlife-habitat-inventory-aquatic-macrophyte-survey-of-the-lower-buffalo-river/oclc/879874150&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Interim Report on Feasibility of Flood Management in the Buffalo River/Lower Tonawanda Creek-Draft Feasibility Report and Draft Environmental Impact Statement*, January 1990

The U.S. Army Corps of Engineers conducted two separate and independent investigations for flood management on the Buffalo River and Lower Tonawanda Creek. On the Buffalo River, the impacts of shoaling within the navigation channel were examined. These impacts were found to be insignificant and the investigation was terminated.

http://www.worldcat.org/title/interim-report-on-feasibility-of-flood-management-in-the-buffalo-metropolitan-area-ny-buffalo-riverlower-tonawanda-creek/oclc/477254264&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Biological Survey Buffalo River and Outer Harbor of Buffalo, NY, Volumes I & II*, June 1982

The U.S. Army Corps of Engineers was considering the feasibility of dredging the Outer Harbor and Buffalo River channels deeper to accommodate deeper draft vessels and/or to construct alternative means of transshipment of raw materials. An intensive study of the Buffalo River, Ship Canal and outer harbor was undertaken with the following general objectives:

- ❖ To evaluate existing conditions in the river and harbor, and to evaluate the biological impact of dredging the existing channel deeper in the Buffalo River and Outer Harbor,
- ❖ To evaluate the biological impact of alternative proposals to dredging such as transshipment of raw materials by conveyor,
- ❖ To evaluate the biological impact of removing debris, old pilings, etc. along the Buffalo shoreline,
- ❖ To evaluate existing conditions in potential disposal areas and to evaluate the biological impact of spoil disposal in these areas, and
- ❖ To provide a functional assessment of the ecological components studied and evaluate their significance with and without project implementation to the area ecosystem.

Volume I contains the analysis and interpretation of existing conditions and assessment of impacts. In Volume II the raw field data is presented in tabular form.

http://digitalcommons.brockport.edu/cgi/viewcontent.cgi?article=1099&context=tech_rep

U.S. Army Corps of Engineers Buffalo District, *Detailed Project Report and Environmental Impact Statement, Cazenovia Creek, West Seneca, New York, Section 205 of the 1948 Flood Control Act as Amended*, May 1986

This study details the flooding problems along Cazenovia Creek and creates a plan to reduce the flooding based upon alternatives developed in a previous study.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Navigable Status of Buffalo River Basin, NY*, February 1976

Currently only the lower 5.8-mile reach of the Buffalo River is used for interstate commerce. There is no interstate commerce on Buffalo, Cayuga and Cazenovia Creeks or their branches. In the past, commercial navigation in the basin has been limited to the portion of the Buffalo River bounded approximately by the limits of the present federal project. The findings on the Buffalo River watershed past, present and future potential navigable use do not meet the criteria for its designation to be navigable waters of the United States upstream from the current jurisdictional limit.

http://www.worldcat.org/title/navigable-status-of-buffalo-river-basin-new-york/oclc/502999946&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Plan of Survey Buffalo River Basin for Flood Control, Allied Purposes and Wastewater Management*, February 1974

The study's objective was the determination of whether any modifications in the recommendations of past reports are advisable at this time, in the interest of flood control, allied purposes, restoration and wastewater management.

http://www.worldcat.org/title/plan-of-survey-buffalo-river-basin-for-flood-control-allied-purposes-restoration-and-wastewater-management/oclc/318901229&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Review of Reports for Flood Control and Allied Purposes on Cayuga, Buffalo and Cazenovia Creeks, NY*, 1967

Major floods occurred in the Cayuga, Buffalo and Cazenovia Creeks basin in June 1937, March 1955, March 1956 and January 1959. Local protection works, consisting principally of channel improvement and levees, would be economically justifiable on Cayuga Creek in Cheektowaga, Cazenovia Creek in Buffalo, Cazenovia Creek in West Seneca in the vicinity of Orchard Park Road, and Cazenovia Creek in West Seneca in the vicinity of Union Road. A diversion channel would not be economically justified.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Plan of Survey for Cayuga, Buffalo, and Cazenovia Creeks, NY for Flood Control and Allied Purposes*, October 1971

The basic goal of the investigation is to develop a plan for the best use, or combination of uses of water resources with a view toward flood control, and allied purposes.

http://www.worldcat.org/title/plan-of-survey-cayuga-buffalo-and-cazenovia-creeks-new-york-for-flood-control-and-allied-purposes/oclc/879860576&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Information, Buffalo Creek*, April 1966

This report provides planners and local governments with technical information on the magnitude and frequency of possible future flooding along Buffalo Creek. In order for floodplain regulations to receive the necessary public support, it is important that residents know the past history of flooding, the purposes and benefits of flood plain regulation, and the ways that these regulations can be coordinated with an overall development plan.

http://www.worldcat.org/title/flood-plain-information-report-buffalo-creek-new-york/oclc/41213688&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Sedimentation Report on Buffalo River and Harbor, NY, July 1942*

The flood control survey report by the Department of Agriculture on the Buffalo Creek watershed, NY recommends upstream programs of erosion control, including farm land treatment, public purchase and treatment of sub-marginal land, and stream bank stabilization. The district engineer recommends that no change be made at this time in the federal maintenance authorization for the Buffalo River and Ship Canal.

http://www.worldcat.org/title/buffalo-river-and-harbor-ny-sedimentation-report/oclc/436233687&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, Section 729 Watershed Study Buffalo River Watershed, New York Initial Watershed Assessment, February 2012

Section 729, as amended, allows the U. S. Army Corps of Engineers (USACE) to assess the water resource needs of entire river basins and watersheds of the United States, in consultation with appropriate federal, state and local agencies and stakeholders.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Engineer Research and Development Center, *Evaluation of the Suitability of Dredged Materials from the Buffalo River Navigation Channel for Beneficial Uses, December 2012*

This report provides the results of a survey and evaluation of the potential beneficial uses of sediment dredged from the upper reach of the Buffalo River Federal Navigation Channel.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Environmental Protection Agency-Great Lakes National Program Office, *Siltation Rates and Suspended Sediment Characteristics, Buffalo River and Tributaries*

The suspended sediment regime of the Buffalo River and tributaries has been non-stationary over the last 200 years. Changes in sediment regime are related to changes in the use of the River, industry along the river, municipal waste practices, soil erosion conservation and implementation.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Environmental Protection Agency-Great Lakes National Program Office, *Draft Buffalo River Ecological Restoration Master Plan (ERMP), April 2011*

This plan aims to identify, prioritize, and facilitate opportunities to restore, protect and enhance habitat within the Buffalo River habitat corridor and its tributaries for a healthy and sustainable ecosystem that will benefit habitat, wildlife, corridor communities, and future generations.

<http://www.buffaloriverermp.ene.com/Documents/Download/b1ccef72-6f3d-4ab3-bbbb-4939f9fb800d?name=ERMP%20Cover%2C%20TOC%2C%20Executive%20Summary.pdf>

U.S. Fish and Wildlife Service, *Assessment of Potential Habitat Restoration Areas within the Buffalo River of Concern, Buffalo, NY, October 1993*

This report provides the results of the assessment of potential habitat restoration areas within the Buffalo River Area of Concern. Chemical residue analysis has revealed that all of the potential habitat restoration sites have contaminant burdens that are greater than environmental concern levels.

http://bnriverkeeper.org/wp-content/05-USFWS%201993_HabitatRestorationAreas.pdf

War Department, United States Engineer Office; *Preliminary Examination Report on Flood Control on Cayuga, Buffalo and Cazenovia Creeks NY*, January 1938

Floods along the Cayuga, Buffalo and Cazenovia Creeks damage the narrow strips of agricultural lowlands along the streams, and parts of the Villages of Lancaster, Depew and East Aurora. Flood waters carry silt into the navigation channel of the Buffalo River that is maintained jointly by the federal government and the City of Buffalo. Sites for retarding reservoirs are available on each creek and it is probable that one or more of these reservoirs and some channel improvements would be economically justified. A survey is recommended.

http://www.worldcat.org/title/preliminary-examination-report-on-flood-control-on-cayuga-buffalo-and-cazenovia-creeks-new-york/oclc/351377886&referer=brief_results

There are a number of additional Buffalo River technical reports that can be accessed at <http://bnriverkeeper.org/programs/buffalo-river-remedial-action-plan/documents/>

CANADAWAY CREEK SUB-WATERSHED

Chautauqua County Department of Health Division of Environmental Health Services, *Village of Fredonia Ground Water Exploration Project*, January 1994

This report details the results of test borings in search of alternative water sources for the Village of Fredonia.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Canadaway Creek at Fredonia Sewer Line Section 14 Emergency Streambank Protection Project Design Documentation Report*, September 2005

The purpose of the project was to protect the Village of Fredonia trunk sewer line from stream bank erosion caused by Canadaway Creek. The proposed plan entails the construction of a trench-fill revetment along the left bank of the stream.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, Dunkirk Harbor, Chautauqua County, New York Operation and Maintenance (Channel Dredging and Discharge of Dredged Material) Finding of No Significant Impact and Environmental Assessment, January 2004

This report is an environmental assessment of dredging and disposing of dredged material at Dunkirk Harbor.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Emergency Streambank Protection Project Village of Fredonia Sewer Trunk Line (Along Canadaway Creek), Town of Dunkirk, Chautauqua County, New York*, February 2002

The purpose of this Environmental Assessment is to provide sufficient information on the potential effects of the proposed action. It was found that construction of the proposed rubblemound revetment would be the preferred alternative.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Emergency Streambank Protection Project Village of Fredonia Sewer Trunk Line (Along Canadaway Creek), Town of Dunkirk, Chautauqua County, New York Environmental Assessment*, February 2014

Four alternatives to the recommended plan were considered and it was found that construction of a riprap filled trench is the preferred alternative.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Operation, Maintenance, Repair, Rehabilitation, and Replacement Manual Streambank Erosion Protection Along Canadaway Creek at Fredonia Sewage Treatment Plant Sewer Line, Town of Dunkirk, New York*, June 2015

This manual has been compiled to assist the Village of Fredonia with the requirements for operating, maintaining, modifying or improving the protective works constructed along Canadaway Creek.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Volume I and Volume II: Project Report Sediment Sampling for Biological, Chemical, and Physical Analysis at Dunkirk Harbor, New York*, September 2001

These reports were prepared by Engineering & Environment, Inc., describing the sampling procedures and results for Dunkirk Harbor.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

Woolpert Consultants, *Waterfront Development Strategy*, July 1992.

This report looks at the potential for development along the City of Dunkirk's waterfront. It assesses the waterfront as a whole, as well as in four segments; Point Gratiot Park, Niagara Mohawk (now NRG Dunkirk Power Plant), Chadwick Bay, and Wright Park.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

CATTARAUGUS CREEK WATERSHED

Erie County Soil and Water Conservation District in cooperation with Cattaraugus and Wyoming County Soil and Water Conservation District, *Erosion Assessment Report Cattaraugus Creek Streambank Restoration Project*, December 2003

Sections of Cattaraugus Creek and several key tributaries were inspected to assess erosion in the watershed.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Evans, Phil and Chris S. Renschler, *Stream Flow and Sediment Modeling for the Cattaraugus Creek Watershed Using the Soil and Water Assessment Tool (SWAT) Project Report*, date unknown

The SWAT model was used to measure runoff and suspended sediment generation in the Cattaraugus Creek sub-watershed. This report includes information describing the characteristics of the sub-

watershed. The model was run with the addition of filter strips, which show decreased sedimentation. Other practices could be modeled this way.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

NYS Department of Environmental Conservation Bureau of Fisheries Region 9 Fisheries Management Office and Lake Erie Fisheries Unit, *Fish Passage at Springville Dam: A Review of Fisheries Issues*, 2006

This report details sport fishing and the issues faced both above and below Springville Dam on Cattaraugus Creek.

http://www.dec.ny.gov/docs/fish_marine_pdf/fishpasscattck.pdf

NYS Department of Environmental Conservation Division of Water, Biological Assessment Cattaraugus Creek, May 1995

The assessment took place along the entire length of the Creek and ranged from non-impacted to slightly impacted. Many sites showed improvements from a 1976 survey. Siltation and turbidity were some of the main impacts.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Pfeil, Erin K., Nicole Casacchia, G. Jay Kerns, Thomas P. Diggins, Distribution, Composition, and Orientation of Down Deadwood in Riparian Old-Growth Woodlands of Zoar Valley Canyon, Western New York State, USA, 2007

This study catalogued downed deadwood in Zoar Valley as compared to make-up of forest, wind direction, etc.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Synapse Energy Economics, Inc., *The Real Costs of Cleaning Up Nuclear Waste: A Full Cost Accounting of Cleanup Options for the West Valley Nuclear Waste Site*, November 2008

The West Valley site holds radioactive materials from the 1960's. The costs of two alternatives, including social costs, were evaluated over a 1000-year period. Rapid and slow leak risks were also evaluated.

<https://www.nirs.org/radwaste/decommissioning/wvfcareport1108.pdf>

U. S. Army Corps of Engineers Buffalo District, *Cattaraugus Creek New York Reconnaissance Report*, March 1986

This report was authorized in 1956 and examines flooding in the basin. It assesses various potential solutions, as well as the economic viability of each and recommends a further feasibility study.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Reconnaissance Report: Flood Damage Reduction/ Environmental Restoration on Cattaraugus Creek*, December 2006

This 905(b) report looked at reducing ice jam flooding to the Seneca Nation Territory downstream on Cattaraugus Creek and identified several possibilities. There was no non-federal cost share partner identified and the project did not move forward.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U. S. Army Corps of Engineers Buffalo District, *Reconnaissance Report: Streambank Protection and Ecosystem Restoration on Cattaraugus Creek*, December 2006

The 905(b) report was authorized by Section 203 to determine the feasibility of carrying out water resource development projects that substantially benefit Indian tribes. Opportunities identified included protection and enhancement of fisheries and restoring habitat for endangered or threatened species.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Final Feasibility Report, Cattaraugus Creek, New York*, December 1987

This feasibility study for flood risk management in Cattaraugus Creek determined that no alternatives were economically feasible or socially acceptable. It also concluded that the Cattaraugus Creek Harbor increased damages due to ice jam flooding.

<http://www.dtic.mil/dtic/tr/fulltext/u2/a201132.pdf>

U.S. Army Corps of Engineers Buffalo District, Section 506 Springville (Scoby) Dam Fish Passage Project, May 2014

This is a feasibility level study of fish passage for Springville Dam performed under Section 506 of the Water Resources Development Act of 2000 (Great Lakes Fisheries and Ecosystem Restoration). The preferred alternative includes lowering the dam and building a fish ladder with sea lamprey control to allow access to better fish habitat upstream.

http://www.springvillewhitewater.org/assets/pdf/SpringvilleDamDPR5_22_2014.pdf

U.S. Army Corps of Engineers, Section 729 Watershed Study Cattaraugus Creek Watershed, NY Initial Watershed Assessment, September 2011

The purpose of this assessment was to identify the problems, needs, and opportunities for the Cattaraugus Creek watershed through stakeholder involvement.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Department of Energy and New York State Energy Research and Development Authority, *Final Environmental Impact Statement for Decommissioning and/or Long Term Stewardship at the West Valley Demonstration Project and Western New York Nuclear Service Center*, January 2010

This report details the history and issues surrounding the West Valley Demonstration Project site in Cattaraugus County along Buttermilk Creek, a tributary to Cattaraugus Creek. Several potential environmental consequences are described.

<http://energy.gov/nepa/downloads/eis-0226-final-environmental-impact-statement>

-Many other documents from the U.S. Department of Energy on West Valley are located here: <http://www.wv.doe.gov/>

-Many other documents from the New York State Energy Research and Development Authority are located here: <https://www.nyserda.ny.gov/About/Publications/West-Valley-Reports>

U.S. Environmental Protection Agency and U.S. Army Corps of Engineers Buffalo District, *Cattaraugus Creek Watershed Resource Guide and Proposed Watershed Planning Strategy*, date unknown

While this report was not finalized, it provides valuable information characterizing the Cattaraugus Creek watershed area including the natural resources to protect, as well as potential pollution sources in the watershed. The project team includes Barry Boyer, Bruce Carpenter, Christopher Renschler, and Roberta Vallone Kellam, Esq.

http://www.lake-erie-fff.org/files/Cattaraugus_Creek_Watershed.pdf

CATTARAUGUS CREEK SUB-WATERSHED

Diggins, Thomas P., *A 300-year Successional Sequence in an Eastern United States Riparian Hardwood Forest*, 2013

Hardwood forests were surveyed in Zoar Valley Canyon to study succession.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Diggins, Thomas P., Richard G. Catterlin, *Topographic Vegetational Patterns on Unlogged Slopes of East-West Zoar Valley Canyon, Western New York State, USA*, 2014

This study investigated slope aspect, elevation, and steepness compared to vegetation patterns in Zoar Valley Canyon.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Diggins, Thomas P. and April M. Newman, *Environmental and Spatial Influences on Benthic Community Composition in Wooded Headwater Streams in Zoar Valley, New York, USA*, 2009

This study determined the relative influences of environmental variation versus spatial autocorrelation on benthic macroinvertebrate community composition of temperate headwater streams.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Section 205 Thatcher Brook, Gowanda, New York*, March 2011

This flood risk management study was performed under Section 205 of the 1948 Flood Control Act after the August 2009 floods. Several alternatives for flood risk management were evaluated and it recommends that feasibility level planning be undertaken as the next step.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Geological Survey, *Flash Floods of August 10, 2009, in Villages of Gowanda and Silver Creek, New York*, 2010

This report describes the weather conditions that led to the floods and the aftermath. It lists high-water marks and annual exceedance probability for the storm levels in the area.

<http://pubs.usgs.gov/sir/2010/5259/pdf/SIR%202010-5259.pdf>

HEADWATERS CATTARAUGUS CREEK SUB-WATERSHED

Joshi, S.R., *West Valley Plutonium and Americium-241 in Lake Ontario Sediments off the Mouth of the Niagara River*. Water, Air, and Soil Pollution. Vol. 42, pp: 159-168. January 1988

Recently deposited fine-grained sediments in Lake Ontario off the mouth of Niagara River contain highly toxic ²³⁸Pu, ^{239,240}Pu, and ²⁴¹Pu (²⁴¹Am) from global fallout as well as from low level releases of these radionuclides from the West Valley radioactive waste management site.

https://www.researchgate.net/publication/279755575_West_Valley_plutonium_and_americium-241_in_Lake_Ontario_sediments_off_the_mouth_of_Niagara_River

NYS Department of Environmental Conservation Region 9 Allegany, NYSDEC Region 9 Trout Stream Monitoring Summary for 2016, October 2016

Summary of stream surveys in 2014 and 2015 in Spring Brook, Lime Lake Outlet, Hosmer Brook, Cattaraugus Creek, Mansfield Creek, Elton Creek, Clear Creek, and McKinistry Creek for wild brown and brook trout populations. Other streams outside of the watershed were sampled as well.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Wyoming County Soil and Water Conservation District, *Cattaraugus and Clear Creek Stream Inspection*, 2003

This includes a stream bank assessment inventory and Buffalo Niagara Riverkeeper Riparian Restoration Report to determine a stream assessment score for various stretches.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Wyoming County Soil and Water Conservation District, *Village of Arcade Streambank Erosion Assessment, Cattaraugus and Clear Creeks Arcade, New York*, July 2009

The Village of Arcade Superintendent of Public Works requested an assessment of stream channel erosion site in the Arcade Village limits. These include cross sectional views and photographs of the erosion sites

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Information Cattaraugus Creek in the Village and Town of Arcade Wyoming County, New York*, July 1968

This report includes maps, profiles, photographs, and cross sections indicating where floods have occurred based on hydrological facts, historical flood heights, and technical data. It does not pose solutions.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

CAYUGA CREEK (Erie County) SUB-WATERSHED

Erie-Niagara Basin Regional Water Resources Planning and Development Board, *Flood Plain Information, Cayuga Creek in The Towns of West Seneca, Cheektowaga, and Lancaster*; May 1967

This report provides information on the magnitude and frequency of possible flooding along Cayuga Creek. It also provides data as a basis for flood plain regulations.

http://www.worldcat.org/title/flood-plain-information-cayuga-creek-in-the-towns-of-west-seneca-cheektowaga-and-lancaster-main-report-and-technical-appendix/oclc/4051329&referer=brief_results

Erie and Niagara Counties Regional Planning Board, *Open Space Preservation Plan for Cayuga Creek-Erie County*, December 1972

This report proposes that the flood plain along Cayuga Creek, from Buffalo Creek to Como Lake Park, be utilized as an open space/recreation corridor. The multiple use of this corridor would provide a measure of control and land for natural open space preservation and active recreation.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Friends of the Buffalo River, *Buffalo and Cayuga Creeks Corridor Restoration Study: Final Report*, September 1997

The report studies the feasibility of extending the ongoing Buffalo River Greenway planning effort to include Buffalo and Cayuga Creeks in the towns of West Seneca and Cheektowaga. The report focuses on lands adjacent to these creeks, with an emphasis on the area's cultural heritage and its functions as a wildlife corridor. It also identifies opportunities and constraints for implementing a continuous riparian greenbelt.

http://www.worldcat.org/title/buffalo-and-cayuga-creeks-corridor-restoration-study-final-report/oclc/61497049&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Final Environmental Statement-Cayuga Creek Erie County, NY*; August 1979

The proposed flood control plan referred to as Plan C recommended for Cayuga Creek, would provide for 100-year flood discharge protection in the Town of Cheektowaga, NY. The recommended improvement would be limited to work in the Cayuga Creek reach from the Union Road bridge to 1,400 feet upstream of the bridge. The proposed project will generate positive and negative environmental impacts.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Cayuga Creek Cheektowaga, NY; Detailed Project Report*

This report summarizes studies made to find an economically feasible, technically practical, and a socially and environmentally acceptable solution to reduce flood damage in the Town of Cheektowaga, NY. Following an analysis and evaluation of both structural and nonstructural alternatives, a structural plan immediately upstream of the Union Road bridge was selected as the best plan to reduce flood damage.

http://www.worldcat.org/title/cayuga-creek-cheektowaga-new-york-detailed-project-report-under-section-205-of-the-1948-flood-control-act-as-amended/oclc/436461753&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Feasibility of Flood Management-Cayuga Creek Watershed*, May 1975

Cayuga Creek overflows its banks almost annually flooding local areas in the Town of Cheektowaga. The purpose of this report is to identify and offer feasible solutions to these problems that would ultimately be developed into a justifiable flood control project. The Cayuga Creek study area includes the entire 40-mile reach. In addition to hydraulic considerations, this feasibility study assesses the hydrologic, ecologic and economic effects that any project would have on the Creek's watershed.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Report on Feasibility of Flood Management in Cayuga Creek Watershed*, August 1975

This report has addressed the problem of flooding along Cayuga Creek and discusses alternative solutions to reduce flood damages consistent with technical, economic, and environmental criteria. Both structural and nonstructural alternatives were considered. Based on these studies flood protection appears economically feasible only in the area of Union Road.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Review of Reports for Flood Control and Allied Purposes-Cayuga Creek, NY*; August 1974

This preliminary study of the Cayuga Creek Basin was one of three initial studies that will form the basis for the eventual preparation of a Phase I report. It reviewed all pertinent data for incorporation into a feasibility study to be done at a later date.

http://www.worldcat.org/title/review-of-reports-for-flood-control-and-allied-purposes-cayuga-creek-new-york/oclc/593915221&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Cayuga Creek-Erie County, NY Preliminary Environmental Survey*; October 1974

This report is a preliminary review of all available environmental data on the Cayuga Creek Basin. Much of the information in this report can be included into Section 2 of the final environmental impact statement for the Cayuga Creek Flood Control Project at the appropriate time.

http://www.worldcat.org/title/cayuga-creek-erie-county-new-york-preliminary-environmental-survey/oclc/436454706&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Reconnaissance Report on Cayuga Creek at Lancaster, NY for Flood Control*; May 1974

The Town of Lancaster has experienced flooding and ice damage in areas adjacent to Ransom Road along Cayuga Creek. It was concluded that a justifiable plan for flood protection in the study area cannot be developed. It was further recommended that local interests adopt flood plain management regulations.

http://www.worldcat.org/title/reconnaissance-report-on-cayuga-creek-at-lancaster-ny-for-flood-control-under-section-205/oclc/421112542&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Project Report on Local Flood Protection on Cayuga Creek at Lancaster, NY*; July 1943

http://www.worldcat.org/title/definite-project-report-on-buffalo-river-basin-local-flood-protection-on-cayuga-creek-at-lancaster-ny/oclc/351377980&referer=brief_results

CHAUTAUQUA CREEK SUB-WATERSHED

Chautauqua County Department of Health, Division of Environmental Health Services and State University of New York Collage at Fredonia Department of Geosciences and Center for Environmental Assessment, *Investigation of Drinking Water Turbidity and Reservoir Sedimentation, Brocton, NY, May 1998*

This report studied turbidity and sedimentation in the Brocton and Ripley Reservoirs due to road embankment erosion, groundwater seepage and excess stream flow. It recommends making some changes to the watersheds of the reservoirs or drawing water from Lake Erie and utilizing the reservoirs for back-up and recreation.

-Contact Chautauqua County Soil and Water Conservation District at (716) 664-2351 to view a copy

Ravi Engineering & Land Surveying, P.C., Chautauqua Rails to Trails, Inc. Stone Culvert Rehabilitation Study, August 2015.

This engineering study was commissioned by Chautauqua Rails to Trail, Inc. to assess the stone culvert that is degrading due to scour from debris build-up following storms. They investigated the feasibility of rehabilitating the structure in order to avoid a wash-out of debris toward Lake Erie.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

U.S. Army Corps of Engineers Buffalo District, *Chautauqua Creek Section 506 Great Lakes Ecosystem & Fisheries Restoration Planning & Design Analysis*, October 2008

The Westfield Water Works Dams expressed interest in modification or removal of a pair of small dams located along Chautauqua Creek in the Village of Westfield, Chautauqua County, New York. These dams are located approximately 300 feet apart and approximately five miles upstream from the mouth of the creek at Lake Erie.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Final Report for Sediment Sampling and Chemical Analysis for Barcelona Harbor, New York - Volume I and Volume II*, November 2000

These reports were prepared by PADIA Environmental, Inc. describing the sampling procedures and results for Barcelona Harbor in Westfield, NY.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Finding of No Significant Impact and Environmental Assessment Section 506 Great Lakes Fishery and Ecosystem Restoration Program Project Westfield Water Works Dams at Chautauqua Creek Town of Westfield, Chautauqua County, New York, February 2008*

Spawning habitat and water quality in the upper ten miles of Chautauqua Creek (above the two dams) is of higher quality than that found in the section downstream of the Waterworks Dams. The proposed plan to restore fish passage to Chautauqua Creek entails the partial removal of the lower dam and the construction of a rock ramp fishway at the upper dam.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Operation, Maintenance, Repair, Rehabilitation, and Replacement Manual Rock Ramp Fishway, Chautauqua Creek, Village of Westfield, Chatauqua County, NY*, March 2015

This manual was compiled to assist the Village of Westfield with the requirements for operating, maintaining, modifying or improving the fish passage features constructed on Chautauqua Creek at the Westfield Waterworks Dams.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

EIGHTEENMILE CREEK SUB-WATERSHED

Erie and Niagara Counties Regional Planning Board, *Open Space Plan for Eighteenmile Creek-Erie County*, August 1973.

The study analyzed existing conditions along Eighteenmile Creek and recommended ways to: (1) preserve and enhance natural open space and (2) minimize potential flood damage in flood plain areas and (3) maximize recreational opportunities for local residents. These recommendations were incorporated into the open space preservation plan that is part of the report.

http://www.worldcat.org/title/open-space-preservation-plan-eighteenmile-creek-erie-county/oclc/27015694&referer=brief_results

Western New York Land Conservancy, *Analysis of the Water Quality of Eighteenmile Creek, Erie County, NY*; May 2003

The purpose of this research project was to compare historical data to data from field samples collected in 2000 to determine if a change has occurred in the waterway, and compare data from all sampling years to current water quality standards.

<http://www.ecswcd.org/docs/awq18c.pdf>

ELLICOTT CREEK SUB-WATERSHED

Erie County Department of Environment and Planning, *A Review of Land Use Controls in the Ellicott Creek Watershed*, March 1992

This report summarizes the status of existing local land use controls within the Ellicott Creek watershed, and presents several examples of model ordinances and local laws currently in place that communities may wish to consider for adoption.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie County Department of Environment and Planning, *Protecting the Ellicott Creek Watershed: A Guide for Local Officials*, April 1992

The Ellicott Creek Improvement Project was a multi-year effort coordinated by the Erie and Niagara Counties Regional Planning Board to study the environment of the Ellicott Creek watershed and to recommend measures to maintain and enhance that environment. This report presents some suggestions to local officials for maintaining the momentum and interest in enhancing Ellicott Creek and its watershed.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie County Soil and Water Conservation District, *Ellicott Creek Stream Inventory-Town of Amherst*, June 2002

This report is an inventory of stream bank erosion and debris snag sites in the section of Ellicott Creek in the Town of Amherst. It was recognized that these factors may be damaging private and public property and causing negative impacts on various aspects of the Creek's resources. The inventory covered the main channel from Youngs Road to Niagara Falls Boulevard.

-Contact Erie County Soil & Water Conservation District to view a copy. (716) 652-8480.

Erie and Niagara Counties Regional Planning Board, *Section 208 Water Quality Management Program, Report 7, Water Quality Data, Stream Sampling and Modeling, Volume I*; January 1979.

The report was intended to identify water quality problems in the two county region. Water quality sampling occurred during the fall 1976 and the summer of 1977. To supplement the chemical/physical data a series of benthic macro invertebrate samples were taken. These samples were used to assess long term environmental stream conditions.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Ellicott Creek Improvement Project-1988-89*, July 1989

Project goals included developing greenways, or networks of public and private open space along the creek, facilitate policy and planning coordination among communities in the Ellicott Creek watershed, and to build a GIS database for the region. Also developed an environmental inventory for the watershed including water sampling.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Ellicott Creek Improvement Project-Final Report*, July 1992

The Ellicott Creek Improvement Project was a three-year effort to analyze the creek and its watershed through an ecosystem approach. The physical environment of the creek and its adjacent lands were studied; riparian owners were contacted for their ideas, public awareness of the creek was raised through a series of participatory events, and recommendations were prepared to restore and enhance the Creek to preserve it as a valuable resource for the future.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Gomez and Sullivan Engineers, *Mapping of Aquatic and Riparian Habitat of Ellicott and Tonawanda Creeks, and Tributaries to Tonawanda Creek*, NYPA, August 2005.

Aquatic habitats in the lower reaches of Ellicott and Tonawanda Creeks are turbid runs that have been dredged, especially the last 11.6 miles of Tonawanda Creek, and part of the Barge Canal which runs backwards 6 months of the year (May-October) and is dredged to a uniform width, depth and slope. Flood control, dredging, and diversion channels have also severely interrupted natural habitat on lower Ellicott Creek. Upper reaches of both creeks are more sinuous with greater habitat variability (run/riffle). Water levels in these creeks and their tributaries (Mud, Ransom, Black, Bull, Sawyer) are potentially influenced by Niagara River water levels.

<http://niagara.nypa.gov/ALP%20working%20documents/finalreports/html/IS18ETC.htm>

NYS Department of Environmental Conservation-Division of Water, *Ellicott Creek Biological Assessment-2001 Survey*

The stream biomonitoring unit conducted biological sampling on Ellicott Creek on July 31, 2001. The purpose of the sampling was to assess general water quality, and determine the cause and spatial extent of any water quality problems. Based on macroinvertebrate indicators, water quality ranged from slightly impacted to moderately impacted, reflecting water quality that was mid-way between good and poor. Sites in Lancaster and Amherst were assessed as moderately impacted.

http://www.dec.ny.gov/docs/water_pdf/ellicottcreek2001.pdf

URS Corporation, *Town of Amherst-Flood Mitigation Plan Report Draft, December 2001*

The study focused on Ellicott Creek, Tonawanda Creek, Ransom Creek, French Creek, Black Creek, and Gott Creek. Historic flood problems were reviewed, flooding causes were identified, and problems assessed as it affects specific structures or classes of structures. Also identified were flood mitigation measures that were evaluated. Budgetary cost estimates were also prepared.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Expedited Section 905(b) (WRDA 86) Analysis Reconnaissance Report, September 2000*

The principal study purpose was to evaluate the federal interest in pursuing feasibility studies of opportunities to reduce flooding and flood damages in the Ellicott Creek drainage basin. This included the re-evaluation of existing reports and recommendations to determine if there would be a current federal interest in modifying these recommendations with regard to flooding and related water resource problems and needs.

http://www.worldcat.org/title/ellicott-creek-new-york-flooding-and-related-water-resources-expedited-section-905b-wrda-86-analysis-reconnaissance-report/oclc/589355807&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Flooding along Ellicott Creek-Lehn Springs, Village of Williamsville; January 1988*

Various alternatives were considered to alleviate the flooding problem for homes and businesses along Ellicott Creek in the area known as the Lehn Springs area of the Village of Williamsville. Reservoirs, major channel excavation, levees, floodwalls and other alternatives were evaluated but eliminated because of their high costs. Channel widening with no deepening was evaluated in detail. This alternative was identified as the recommended plan.

http://www.worldcat.org/title/section-205-reconnaissance-report-flooding-along-ellicott-creek-lehn-springs-village-of-williamsville-erie-county-ny/oclc/320968718&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Final Supplement to the Final Environmental Impact Statement, February 1983*

This supplement to the Final Environmental Statement for Ellicott Creek describes design modifications made to Modified Plan E. This plan is designed to provide flood control for residences and commercial establishments in the Towns of Amherst and Tonawanda. The redesigned plan calls for a large diversion channel to be constructed north of the creek. Other minor project design changes and the resulting environmental impacts are described.

http://www.worldcat.org/title/ellicott-creek-erie-county-new-york-final-supplement-to-the-environmental-impact-statement/oclc/173832847&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Flood Hazard Evaluation Report-Town of Alden*, January 1983

This report investigates the potential flood situation along Ellicott Creek from Crittenden Road Bridge upstream to the County Line Road Bridge, a distance of 2.9 miles. Although large floods have occurred, studies indicate that even larger floods are possible. It provides a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevent intensification of flood losses. It will also aid in the development of other flood damage reduction techniques to modify flooding and reduce flood damages that could be part of a Flood Plain Management program.

http://www.worldcat.org/title/special-flood-hazard-evaluation-report-ellicott-creek-erie-county-new-york/oclc/54811676&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Final Environmental Statement-Flood Control, Ellicott Creek*; February 1979

The proposed flood management plan for the lower Ellicott Creek sub-watershed is Modified Plan E, a combination major channelization-diversion channel. This plan is designed for 100-year flood discharge in the Towns of Amherst (downstream of Maple Road) and Tonawanda and provides a varying level of flood protection. The environmental impacts of the proposed project are identified and reviewed.

http://www.worldcat.org/title/final-environmental-statement-flood-control-ellicott-creek-erie-county-new-york/oclc/882928528&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Final Environmental Statement-Flood Control, Ellicott Creek*; January 1977

Reviews and analyzes the environmental, social well-being, and economic impacts, and the engineering feasibility of flood control alternatives along the lower reaches of Ellicott Creek.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Survey of Aquatic Benthic Macroinvertebrates and Evaluation of Benthic Habitats within the Ellicott Creek Study Area*, June 1975

It is apparent from the quantitative and qualitative analyses of the benthos, and the physical nature of Creek sediment, that these areas were polluted by organic pollutants, most likely due to inadequately treated municipal sewage and overflows from combined collection systems. There also appeared to be some industrial contamination in the lower reaches of the Creek. The removal or other disruption of the benthic communities would have little negative impact on the aquatic ecology of the Creek.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Ellicott Creek Basin-Summary Report, Volume 1-Main Report, Volume 2-Appendices*; August 1973

The study includes an investigation of 31 proposals to provide flood control and other benefits in the Ellicott Creek basin. The proposals can be categorized into broad classifications of channelization, diversion, reservoirs, levees, floodplain management, public acquisition, do nothing, or a combination of the classifications. Costs and benefits have been evaluated for each proposal and the social and environmental impacts assessed. The study considers all present and future water oriented needs of the basin. Detailed analyses of the plans investigated are contained in the technical report and appendices.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Review Survey Report for Flood Control and Allied Purposes-Environmental Impact Assessment*, November 1972

Thirty proposals were examined to provide flood control and other benefits in the Ellicott Creek Basin. Three schemes were selected for further examination: Sandridge Dam and Reservoir with minor channel improvements downstream, major channel improvements in Amherst, and a diversion channel in Amherst. This report examines the environmental impacts of these schemes.

http://www.worldcat.org/title/review-survey-report-for-flood-control-and-allied-purposes-ellicott-creek-new-york-environmental-impact-assessment/oclc/326880513&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Plan of Study for Flood Control and Allied Purposes*, March 1972

The basic objective of the restudy of Ellicott Creek is to determine and report to Congress whether any modifications should be made in recommendations contained in the 1970 Survey Report to provide flood protection, and to provide for water needs allied to flood control.

http://www.worldcat.org/title/plan-of-study-ellicott-creek-new-york-for-flood-control-and-allied-purposes/oclc/326880575&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Information-Ellicott Creek in the Towns of Lancaster and Alden and Village of Alden*, October 1972

The study covers approximately 13.8 miles of Ellicott Creek in the Town of Lancaster, upstream to Crittenden Road in the Town of Alden. The report was intended to provide planners and local governments with technical information and data on possible future floods. It is recommended that these floods be considered when development within the flood plain is planned. This report provides a basis for effective and workable legislation for the control of land use within the flood plain.

http://www.worldcat.org/title/flood-plain-information-ellicott-creek-in-the-towns-of-lancaster-alDEN-and-in-the-village-of-alDEN-erie-county-new-york/oclc/4090199&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Survey Report for Flood Control and Allied Purposes*, 1970

The District Engineer finds that there are three alternatives for development of water resources in the basin that would be economically justifies: major channel improvement in the downstream reaches for flood control alone, a multiple purpose reservoir at the Sandridge site, and the Sandridge Reservoir in combination with minor downstream channel improvement. The Sandridge Reservoir in combination with minor downstream channel improvement is recommended for construction.

http://www.worldcat.org/title/survey-report-for-flood-control-and-allied-purposes-ellicott-creek-new-york/oclc/33868168&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Information in the City of Tonawanda and the Towns of Tonawanda, Amherst, Cheektowaga and Lancaster*, January 1968

The study covers approximately 21.8 miles of Ellicott Creek from its confluence with Tonawanda Creek in the City of Tonawanda, upstream to Stony Road in the Town of Lancaster. The report was intended to provide planners and local governments with technical information on the largest known floods of the past and to present data on possible future floods. Planners and local officials have a basis for effective and workable legislation for the control of land use within the flood plain.

http://www.worldcat.org/title/flood-plain-information-ellicott-creek-in-the-city-of-tonawanda-and-in-the-towns-of-tonawanda-amherst-cheektowaga-lancaster-erie-county-new-york/oclc/34595410&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Preliminary Examination Report on Flood Control*, March 1939

The district engineer reports that protection from floods would probably require reservoir construction or widening, deepening and straightening channels, including alterations to bridges. It is believed that the cost of these improvements will exceed the benefits and recommends that no survey be made at this time.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

MURDER CREEK SUB-WATERSHED

Murder Creek is generally considered by local agencies to be a part of the Tonawanda Creek sub-watershed. This may explain why there are no reports that focus specifically on Murder Creek.

NIAGARA RIVER SUB-WATERSHED

Buffalo Niagara Riverkeeper, *Scajaquada Creek Revitalization Efforts: A Quick Guide*, August 2010

Highlights current and planned initiatives to revitalize Scajaquada Creek.

<http://scajcreek.net/wp-content/uploads/2010/03/Scajaquada-Creek-Revitalization-Efforts-a-Quick-Guide.pdf>

Buffalo Niagara Riverkeeper, *Cayuga Creek Watershed, Niagara County NY, Report Card*

The purpose of the report card was to provide a brief overview of the health, improvements and current conditions of the Cayuga Creek watershed (Niagara County) that includes Cayuga and Bergholtz Creeks and their tributaries. The report card has six indicators related to the health of the watershed: water quality, fish and wildlife, public access and recreation, environmental education and public involvement, land use and planning, and contamination.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

City of Buffalo, *Buffalo Waterfront Plan: Local Waterfront Revitalization Plan DRAFT*, June 2014

The City of Buffalo Office of Strategic Planning has put together a framework for land along the Niagara River, Buffalo River, and Scajaquada Creek to, “safeguard the City’s natural water resources;

water based economic development; and community interests.” Projects are listed to establish those goals.

http://www.buffalogreencode.com/LWRP/BuffaloLWRPDocument_Whole.pdf

City of Buffalo, NYS Department of Transportation, and US Department of Transportation Federal Highway Administration; *Queen City Waterfront, Final report for the Buffalo Corridor Management Plan*, April 2007.

This plan was developed with the City of Buffalo Local Waterfront Revitalization Program (LWRP) as a complementary implementation guide reinforcing LWRP policies. It contains a comprehensive summary and review of recently completed, ongoing, planned, and hoped for waterfront projects in the City of Buffalo. The report also contains more detailed work on waterfront areas that were not previously addressed in previous planning reports. It presents aspirations through vision, policy, projects, designs, and a framework for setting waterfront priorities and managing implementation.

http://urbandesignproject.ap.buffalo.edu/projects/wci/QCW_Volume1_Strategy.pdf

City of North Tonawanda, *Gratwick Riverside Park Conceptual Master Plan*, March 2008.

The City of Tonawanda seeks to improve and enhance Gratwick Riverside Park as a destination gateway along the Niagara River corridor in accordance with the vision articulated in the regionally approved Niagara River Greenway Plan. The conceptual master plan includes a variety of proposed improvements that are intended to protect, preserve, enhance and develop the park for a diverse recreational and educational visitor experience including wildlife habitat enhancement for the support of fish and bird populations.

<http://niagara.nypa.gov/RelicensingGreenwayFunds/HostCommunity/Gratwick%20Park.pdf>

Environment Canada Water Quality Monitoring & Surveillance – Ontario, *The Niagara River Upstream/Downstream Program 1986/87 - 2004/05 Concentrations, Loads, and Trends*, Unknown Date

Summarizes changes and trends in the concentrations of chemicals monitored under the Upstream/Downstream Program at Fort Erie and Niagara-on-the-Lake stations over the period 1986/87 to 2004/05.

http://www.dec.ny.gov/docs/water_pdf/nrtrends05rpt.pdf

Erie-Niagara Basin Regional Water Resources Planning and Development Board, *Flood Plain Information-Scajaquada Creek in the Towns of Cheektowaga and Lancaster*, May 1969

Its purpose was to aid in the understanding of the local flood problems and to provide guidance in the selection of the best uses for lands susceptible to overflow. This study covers approximately 6.9 miles of the Creek from Interstate Route 90 in the Town of Cheektowaga upstream to Stony Road in the Town of Lancaster. This report does not include plans for the solution of flood problems.

http://www.worldcat.org/title/flood-plain-information-scajaquada-creek-in-the-towns-of-cheektowaga-and-lancaster-erie-county-new-york/oclc/4129260&referer=brief_results

Erie and Niagara Counties Regional Planning Board, *Cayuga Creek (Niagara County) Water Quality Study*, August 1975

This report identifies the problems, discusses alternative corrective measures and recommends a remedial action program for Cayuga Creek.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Gill Creek-Enhancement of Environmental Quality*, March 1974

This report identifies the problems, discusses alternative corrective measures, and recommends a remedial action program for Gill Creek. As a major justification for remedial action, the potential for recreational development and use is examined. Also identified are possible recreational activities that could be implemented.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Two Mile Creek Water Quality Study*, July 1976

This report examines the feasibility of developing the water resources of Two Mile Creek. It's primarily urban setting, intermittent nature, and industrial and municipal discharges impact its recreational and aesthetic value. The existing physical, chemical, and biological conditions of the Creek are described along with several possible remedial measures to enhance its recreation potential.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Niagara River Environmental Plan-Summary Report*, June 1972

This study examines environmental conditions in the Niagara River Corridor in relation to pollution sources, geophysical features, land use and population concentrations, prominent buildings, highways and entrance ways, and tourist activity concentrations. Design concepts were developed to meet environmental problems identified and both short and long range plans were developed to meet environmental goals. Potential roles for government at all levels in managing the river system to carry out the plans were identified and evaluated.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Cayuga Creek Water Quality Study-Niagara County*, August 1975

Existing physical conditions along Cayuga Creek-Niagara County are not conducive to its use as a recreational resource. It lacks the aesthetics quality of a clean stream. This report identifies the problems, discusses alternative corrective measures and recommends a remedial action program for Cayuga Creek. The implementation of this program will make implementation of the previous Cayuga Creek recreation study easier.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Friends of the Buffalo Niagara Rivers, K. Frothingham & N. Brown, Buffalo State College Department of Geography and Planning; *Cayuga Creek Watershed Stream Assessment*, February 2005

The projects purpose was to collect qualitative baseline data on a number of physical, chemical, and biological elements in the Cayuga Creek, Niagara County watershed. Study results could contribute to and help guide watershed management activities.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Gradient Corporation/GeoTrans, Inc., *Potential Contaminant Loadings to the Niagara River from U.S. Hazardous Waste Sites*, February 1988

Provides a detailed description of the potential contaminant contributions to the Niagara River from all U.S. hazardous waste sites that were considered significant and for which data was available.

-Contact Mark Filipski at NYS Department of Environmental Conservation to view a copy. (716) 851-7000

International Joint Commission, *Niagara River Area of Concern Status Assessment*, June 2002

Examines progress toward restoration and protection of beneficial uses; assesses program implementation relative to necessary remedial and preventive actions; and makes recommendations on specific activities that could be undertaken to overcome challenges.

<http://ijc.org/php/publications/html/niagstat.html>

International Niagara Board of Control, *Construction of Niagara River Remedial Works-Report to the International Joint Commission*, September 1960

This report describes the construction of the Niagara Remedial Works that was accomplished between June 1954 and July 1957 of the Niagara Remedial Works. The report includes a summary of the conditions prior to construction and of the plans and objectives adopted by the International Niagara Falls Engineering Board and the International Joint Commission. It also contains a statement of the cost of construction and a discussion of the degree of attainment of the objectives.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

International Niagara Working Committee, *A Report on an Evaluation of 1975-76 Data Collection Program in Connection With the Lake Erie-Niagara River Ice Boom Study*, December 1976

This report documents the ice and meteorological data collection program conducted on eastern Lake Erie during the 1975-76 winter season.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Lakes Erie-Ontario Advisory Board, *Summary Report on Pollution Abatement Progress in the Niagara River Area to the International Joint Commission*, August 1971

A summary of pollution abatement progress since 1967.

<http://scholar.uwindsor.ca/cgi/viewcontent.cgi?article=1025&context=ijcarchive>

Lakes Erie-Ontario Advisory Board, *Summary Report on Pollution of the Niagara River to the International Joint Commission*, October 1967

Although there has been considerable waste reduction progress since 1951 directed toward improving the characteristics of the Niagara River water to meet the "Objectives For Boundary Water Quality Control" established by the International Joint Commission, there remains some areas in the river in which the water quality fails to meet the objectives occasionally or all the time. Because of the larger population and industrialization on the U.S. side, most of the wastes causing pollution of the Niagara River originate in the United States. <http://www.ijc.org/files/publications/N32.pdf>

National Fish and Wildlife Foundation, *Bi-national Assessment of Marsh Habitat Quality*, January 2011

Monitoring relative population status and community structure of marsh birds and amphibians within the Great Lakes basin can help us evaluate how well marshes are functioning to maintain

ecological integrity. The Marsh Monitoring Program is a bi-national marsh bird and amphibian monitoring program, coordinated by Bird Studies Canada and the U.S. Environmental Protection Agency. Since the program's inception in 1995, one of its primary objectives has been to contribute to the assessment and long term monitoring of Great Lakes Areas of Concern such as the Niagara River AOC. http://www.dec.ny.gov/docs/regions_pdf/marshassess.pdf

National Park Service, *Niagara River National Heritage Area Study*, 2005

A study was conducted of the suitability and feasibility of establishing a Niagara Falls National Heritage Area. It was recommended that a heritage area be established and a management plan is being prepared.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYPA STUDIES

As part of the relicensing process for the Niagara Power Project (NPP), the NY Power Authority commissioned over 40 studies describing the project's impact on the environment. Many of these studies contain useful information for limited geographic areas, such as GIS maps and data layers on terrestrial and aquatic habitats. The main reports summarized here are found at: <http://niagara.nypa.gov/studyreports/finalreports.htm>. GIS layers are available on request from NYPA's environmental science office at: Edward.Alkiewicz@nypa.gov. Much of the information that follows was taken from Buffalo and Niagara Rivers Habitat Assessment and Conservation Framework, Buffalo Niagara Riverkeeper, November 2008.

Acres International Corporation, *Fish Entrainment and Mortality Study*, NYPA, August 2005.

Includes maps showing aquatic vegetation and river depths. Based on comparison with other hydro projects but no actual measurement of fish mortality at NPP tailraces, the study concludes that most fish entrained at intakes and turbines are small (< 12 inches), that 70% are likely to survive, and that most would be swept over the falls anyway with 0% survival. Does not consider physical barriers at the intakes to be feasible. Study also notes its limits in terms of major dissimilarities between the NPP and other US hydropower plants in size and configuration, suggesting they are not comparable.

Aquatic Science Associates, *Describe Niagara River Aquatic and Terrestrial Habitat Between the NYPA Intakes and the NYPA Tailrace*, NYPA, August 2005.

Describes water level changes in upper and lower river reaches due to NPP operations, and effects on habitat. Above the falls the average change is 1.5 feet daily in tourist season with little or no effect on shoreline habitat that is largely hardened with fill, riprap or other armoring. In the lower river near the Falls water levels change by as much as 12 feet per day, at Lewiston the average daily fluctuation is 1.5 feet. The study speculates that water level changes could affect sturgeon spawning habitat downstream from Fosters Rapids, and that stormwater runoff, recreational use and invasive species probably impact terrestrial habitat more than water level changes.

Baird, W.F. & Associates Coastal Engineers Ltd., *Shoreline Erosion and Sedimentation Assessment Study Upstream and Downstream of the Power Project*, NYPA, August 2005.

This visual assessment of shoreline conditions from a boat shows:

- lower river shoreline-14% actively eroding, 37% hardened (bulk heading, riprap, etc.)
- upper river shoreline-3% is actively eroding, 63% is hardened
- tributaries (within NPP impact area)-4% is actively eroding; 40% is hardened

The primary erosive forces are wind-generated and boat-generated waves, and river currents.

Conestoga-Rovers and Associates, *Determine if the Ice Boom has Climatic, Aquatic, Land Management or Aesthetic Effects*; NYPA, August 2005.

On the basis of a review of existing studies, concludes that the ice boom has negligible effects on local climate and ice dissipation at the east end of Lake Erie, especially since 1984 when boom removal was moved up to before April 1, and on ecological resources and agriculture. It finds no negative aesthetic effects to adjacent properties from ice boom storage on the Erie shoreline adjacent to Times Beach, but holds open the option of finding an alternative site.

E/PRO Engineering and Environmental Consulting, *Effects of Land Management Practices on Aquatic and Terrestrial Habitats*, NYPA, August 2005.

Looks at management practices on the 1,700 upland acres of NYPA's 3,700 acres of project and non-project land. Concludes there may be negative effects on habitat, especially from vegetation management (mowing, herbicides, landscaping with invasive species) and road maintenance (runoff of pollutants and winter salts), but that these practices are widespread throughout the Niagara Region. Should be cross-referenced with studies by P.M. Eckel on the unique vegetation and habitats of the Niagara River and gorge, and her "Preliminary Proposals for Relicensing Settlement" (July 2004) for managing these nationally significant biotic resources.

Environmental Standards, Inc., *Extent of Sedimentation and Quality of Sediment in the Lewiston Reservoir and Forebay*, NYPA, August 2005.

This report describes the results of a sediment quality investigation in the Lewiston Reservoir and Forebay as part of the Niagara Power Project relicensing agreement.

Gomez and Sullivan Engineers, *Cayuga Creek Watershed Assessment Summary Report*, NYPA, June 2006.

Report is a literature review of the Cayuga Creek watershed in Niagara County, including GIS maps and data on land use, habitats, wetlands, soils, hydrology, etc. See the recommendations for creek and habitat restoration. Riverkeeper developed a Cayuga Creek Watershed Report Card on the basis of this report, rating overall water quality "D", and fish and wildlife habitat "C" due to channel alterations, loss of riparian vegetation and wetlands, fragmentation and fish barriers. Cayuga Creek fish evidence shows continuing toxic contamination (PCBs, mirex, dioxin, dieldrin, chlordane) from Love Canal and the 102nd Street landfill.

Gomez and Sullivan Engineers, *Gill Creek Fish Survey*, 2004, NYPA, August 2005.

Fish sampling (seining and/or electrofishing) at 16 sites along Gill Creek in May, July and September 2004 found 37 species dominated by emerald shiner, bluntnose minnow and

pumpkinseed in lower reach, creek chub in middle reach, and brook stickleback, central mudminnow, fathead minnow and white sucker farthest upstream by the Lewiston Reservoir.

Gomez and Sullivan Engineers, *Mapping of Aquatic and Riparian Habitat of Ellicott and Tonawanda Creeks, and Tributaries to Tonawanda Creek*, NYPA, August 2005.

Aquatic habitats in the lower reaches of Ellicott and Tonawanda Creeks are turbid runs that have been dredged, especially the last 11.6 miles of Tonawanda Creek, and part of the Barge Canal which runs backwards 6 months of the year (May-October) and is dredged to a uniform width, depth and slope. Flood control, dredging and diversion channels have also severely interrupted natural habitat on lower Ellicott Creek. Upper reaches of both creeks are more sinuous with greater habitat variability (run/riffle). Water levels in these creeks and their tributaries (Mud, Ransom, Black, Bull, Sawyer) are potentially influenced by Niagara River water levels.

Gomez and Sullivan Engineers, *Mapping of Submerged Aquatic Vegetation in Lewiston Reservoir*. NYPA, August 2005.

No extensive SAV beds were observed in the reservoir.

Gomez and Sullivan Engineers, *Use of Buckhorn Marsh and Grand Island Tributaries by Northern Pike for Spawning and as a Nursery*, NYPA, August 2005.

The Buckhorn Marsh Restoration Project includes 2 weirs protecting water levels from NPP river fluctuations. Northern pike and largemouth bass use the marsh for spawning and as a nursery. High weir prevents pike and bass from migrating in or out of the marsh impoundment; dense cattails prevent migration through Burnt Ship Creek. Study concludes that the best way to increase fish passage in and out of the marsh is through creating more open channel through cattails.

Kleinschmidt Associates et al., *Investigation of Habitat Improvement Projects for the Niagara Power Project*, NYPA, August 2005.

The HIP relicensing settlement provides \$12 million for 8 projects, the Habitat Enhancement and Restoration Fund provides \$1 million per year for 50 years. This report includes design, management and monitoring plans for 17 possible HIPs including:

1. Strawberry Island wetland creation
2. "Frog Island" restoration
3. Motor Island shoreline protection
4. Beaver Island wetland restoration
5. Spicer Creek tributary enhancements
6. Gun Creek tributary enhancements
7. Fish access to Burnt Ship Creek
8. Control of invasive species at Buckhorn and Tift marshes
9. Shallow water habitat creation near mouth of Burnt Ship Creek
10. Feasibility of restoring native terrestrial plants at Goat Island and in the gorge
11. Osprey nesting platforms
12. Black tern nesting at Tift
13. Common tern nesting, Buffalo Harbor and upper river

14. Enhancements to the Motor Island heron rookery
15. Installation of fish habitat/attraction structures, upper river
16. Native coregonid (Lake Ontario whitefish, lake herring, deep water cisco) hatchery
17. American bittern hacking program

Kleinschmidt Associates, *Recreational Facility Use and Capacity Investigation*, NYPA, August 2005.

Investigated 29 recreation sites in power plant vicinity from April 2002-March 03 that showed 86% of recreational use is focused on Niagara Falls and Reservation State Park. Eighty percent involved shoreline use, 20% boating activity. Overall sites are being used below their capacity with three exceptions: parking at Ontario St., Lewiston Landing and Ft. Niagara boat launch.

Kleinschmidt Associates, *Addendum to the Recreational Facility Use and Capacity Investigation*, NYPA, August 2005.

Looks at three more upper river sites: Tow Path Park, Bird Island Pier and Broderick Park. Broderick Park is the most heavily used, and use at all sites is within design capacities.

Kleinschmidt Associates, *Recreation Needs Assessment*, NYPA, August 2005.

Conclusions are the same as the 2003 report. Notes need to improve interfaces between recreation sites along the gorge with lower river sites and with downtown Niagara Falls. This report notes that public access to the gorge from adjacent local neighborhoods is constrained and fragmented by the Robert Moses Parkway.

The Louis Berger Group, Inc., *Describing Contaminant Levels in Fish in the Lewiston Reservoir*, NYPA, August 2005.

The study objective was to describe the concentration of contaminants in Lewiston Reservoir fish and to document available information regarding contamination of upper Niagara River fish. There were no tissue data available for fish in the Lewiston Reservoir however.

New York Power Authority, *Determine to What Extent Niagara Power Project Operations Affect The Transport Of Groundwater And Contaminants*, August 2005.

The New York Power Authority was in the process of relicensing the Niagara Power Project in Lewiston, NY. As part of the relicensing process, NYPS developed information related to various aspects of power plant operations including an assessment of the impacts on groundwater flow patterns and groundwater quality. This report describes the activities and presents the findings of the groundwater investigation conducted in the project vicinity from spring 2003 through spring 2004. The investigation area is bounded to the north by the Niagara escarpment, to the east by the Tuscarora Nation eastern boundary/Cayuga Creek, to the south by the upper Niagara River, and to the west by the lower Niagara River.

Normandeau Associates, Inc., *Recreational Fishing Survey of the Upper Niagara River*, NYPA, August 2005.

Anglers and fish catch were counted from April 2002-Nov. 2003. Shore anglers mainly caught yellow perch (28%), followed by round goby (25%), rock bass (19%) and smallmouth bass (13%). They harvested 43% of total catch (est. 186,000 fish). Boat anglers mainly caught

smallmouth bass (48%), followed by largemouth bass (16%), yellow perch (13%) and northern pike (8%). Boat anglers harvested 13% of total catch (71,000 fish). Most upper river shore trips were at the Buffalo waterfront; most boat trips to the Tonawanda Channel.

Riveredge Associates, *Assessment of the Potential Effects of Water Level and Flow Fluctuations and Land Management Practices on Rare, Threatened, and Endangered Species and Significant Occurrences of Natural Communities at the Niagara Power Project*. NYPA, August 2005.

Finds 49 rare, threatened or endangered (RTE) species or significant natural communities in the project area that could be affected by NYPA activities including changes to water level and flow. These include lake sturgeon, bald eagle, common tern, least bittern and pied-billed grebe, 3 unprotected species of native mussel, and 3 significant natural communities. Specifically, at risk from changes to flows and levels may be pied-billed grebe nesting areas, lake sturgeon spawning areas in the lower river, and the deep emergent marsh community at Buckhorn. Land management activities could impact 3 additional plant species, and the calcareous cliff and talus slope woodland communities of the Niagara gorge.

Riveredge Associates, *Occurrences of Rare, Threatened, and Endangered Mussel Species in the Vicinity of the Niagara Power Project*, NYPA, August 2005.

Of the 31 species of mussel historically identified in the Niagara River project area, these 2001-2 field surveys found evidence (spent shells or live animals) of 16 species, 10 rare and 6 common (including zebra mussels). The majority of these were found on Grand Island near Beaver Island, Buckhorn Island and Spicer Creek.

Stantec Consulting Services, Inc., *A Recreational Fishing Survey of the Lower Niagara River in 2002 and February 2003*, NYPA, August 2005.

Counted shore and boat anglers and species caught on the lower Niagara River, May 2002-June 03, and Niagara Bar (1 mile out into Lake Ontario), October 2002- March 03. Shore anglers mainly caught smallmouth bass (28%), followed by rock bass (20%), yellow perch (12%), white bass (10%), freshwater drum (9%), round goby (8%), and salmonids (5%). White bass were the most harvested (66%). Shore anglers harvested 20% of the total catch (est. 360,000). Boat anglers mainly caught smallmouth bass (58 %), except during winter when the primary catch was salmonids. Boat anglers harvested 15% of total river catch (est. 74,500 fish); and 3% of bar catch.

Stantec Consulting Services, Inc., *A Recreational Fishing Survey of the Lewiston Reservoir in 2002*, NYPA, August 2005.

Anglers and catch counted April-Nov. 2002. Yellow perch was targeted species in spring, smallmouth bass in summer and fall. Yellow perch was 68% of total count, followed by smallmouth bass, rock bass, white bass, northern pike and freshwater drum. Anglers harvested 83% of yellow perch; 81 % of white bass; and 65% of total catch (est. 23,000 fish).

Stantec Consulting Services, Inc. et al., *Effect of Water Level and Flow Fluctuations on Aquatic and Terrestrial Habitat*, NYPA, August 2005.

Looks at the potential effects of water levels and flow fluctuations on 19 fish, 15 wildlife, and 3 macroinvertebrates species. Concludes that these “could result in changes” to coastal wetland habitat structures, distribution and species in upper river, but there are no coastal

wetland habitats in the lower river. Also that these could affect the spawning, egg and larval habitats of several fish species, mayfly nymphs and giant floater mussels, but that suitable habitat exists at greater (unaffected) depth for these species, except white sucker which has a narrow range of spawning depth. Argues that suitable habitat exists outside of fluctuation zone for the green frog, northern leopard frog, common mudpuppy, common snapping turtle, midland painted turtle, Virginia rail, American coot, and spotted sandpiper.

TRC Engineering and Riveredge Associates, *Feasibility Study for the Restoration of Native Plants in the Vicinity of the Niagara Gorge*, NYPA, January 2008.

Inventories native and invasive plants in the Niagara Gorge from Goat Island to Artpark based on a literature review and 2007 field surveys, to determine the feasibility of restoring native terrestrial rare, threatened or endangered plants. Finds that about 75% of the vegetation is native, with 11 extant T & E species. Concludes that community-level restoration is not feasible, but pilot-level projects may be possible in selected areas with specific features.
<http://niagara.nypa.gov/RTE.pdf>

URS Corporation, *Describe the Effects of Project Construction on the Surrounding Environment*, NYPA, August 2005.

Useful for ascertaining pre-power project river conditions, especially around the north end of Grand Island. Includes maps showing relocation of Fish and Gill Creeks; final placement of sediment, soil and rock (e.g. Goat Island was expanded by 8.5 acres); and location of intakes, tunnels and other infrastructure. How much aquatic and riparian habitat was lost? The report doesn't say, but this may be estimated by comparing pre- to post-NPP topographic maps.

URS Corporation, *Ecological Condition of Gill, Fish and Cayuga Creeks*, NYPA, May 2004.

"Major issues affecting the ecological condition of Fish, Gill and Cayuga Creeks include sediment contamination, groundwater flow pattern, stream channelization, natural and man-made fish barriers, and land use and management practices". The lower reaches of Gill and Fish Creeks have been diverted, culverted and lined with concrete. Cayuga Creek headwater tributaries have been ditched for farmland drainage, lower reaches are channelized for flood control, and middle reaches realigned and culverted around the Niagara Falls airport. Fish from lower Gill and Cayuga Creeks are contaminated with PCBs and dioxin linked to contaminated sediments near hazardous waste landfills. "Due to the many constraints . . . restorative actions to improve the ecological and geomorphic function of the creeks are not addressed in this study."

<http://bnriverkeeper.org/wp-content/uploads/2014/06/ECOLOGICAL-CONDITION-OF-GILL-FISH-AND-CAYUGA-CREEKS.pdf>

URS Corporation, *First-Stage Consultation Report: Niagara Power Project*, NYPA, December 2002.

Maps 10 wetland communities and deepwater habitats and 11 upland plant community types in the vicinity of the Niagara PP. Field surveys found 15 state-listed endangered or threatened plant species, 1 federally-listed endangered species (bald eagle), and 9 state-listed endangered or threatened animal species, including the peregrine falcon and the short-eared owl.

URS Corporation, *Impediments and Opportunities for the Future Use and Disposition of the Robert Moses Parkway*, NYPA, August 2005.

Should the portion of the Robert Moses Parkway along the east rim of the Niagara Gorge be removed to improve ecology and accessibility? This report does not answer that question but identifies impediments and opportunities associated with the many plans and proposals to enhance, modify or remove the NYPA constructed Parkway.

URS Corporation, *Niagara River Water Level and Flow Fluctuation Study*, NYPA, August 2005.

Includes maps and graphs showing the magnitude, frequency and spatial extent of fluctuations associated w/ PP and IJC regulation of Grass Island Pool, permitting daily fluctuation up to 1.5 feet. "Water fluctuation in the lower river . . . upstream of the Project tailrace, can be as high as 12 feet per day." At Lake Ontario the average is 0.6 feet/day. In Lewiston Reservoir the range is 3-18 feet/day and as much as 36 feet/week.

URS Corporation, *Surface Water Quality of the Niagara River and Its Tributaries*, NYPA, August 2005.

This report documents the surface water quality of the Niagara River, its U.S. tributaries, and the Lewiston Reservoir including Cayuga Creek, Gill Creek, Fish Creek, Tonawanda Creek, Ellicott Creek, Burnt Ship Creek, Woods Creek, Gun Creek, Spicer Creek and Big Sixmile Creek.

URS Corporation, *Upper Niagara River Tributary Backwater Study*, NYPA, August 2005.

This is a supplement to the above referenced Niagara River Water Level and Flow study, looking at the effects of changes in river levels and flows on seven tributaries-three on Grand Island plus Cayuga, Bergholtz, Tonawanda and Ellicott Creeks. Of special note is the discussion of flows in relation to Barge Canal operations on Tonawanda Creek. When the Lockport lock is opened, up to 1100 cfs is diverted from the Niagara River into the canal. Changes in Niagara water levels could thus influence flow as far as 19 miles upstream on the canal.

NYS Department of Environmental Conservation, *Niagara River Remedial Action Plan*, September 1994

The mission of the RAP is to restore the chemical, physical, and biological integrity of the Niagara River ecosystem that reflects the community's concern for the remediation, preservation and protection of the river. Specific goals of the RAP are the protection and enhancement of human health, fish and wildlife, aesthetics and recreation, and the economy of the Niagara River Area of Concern. Drinking water, bathing and aquatic life have been established as the best uses of the Niagara River through a public process under the NYS Stream Classification System. The RAP is intended to restore these uses where they have been impaired and to move toward the reduction of all pollutant sources.

The RAP defines the AOCs environmental problems, identifies remedial measures needed to restore beneficial uses with a time schedule and designation of the responsible agency, and describe a monitoring process needed to track remediation. The NYS DEC intends to use the RAP as a management document to guide and coordinate remedial actions on the Niagara River by various

concerned agencies for an improved federal, state, and local partnership in addressing the goals of the plan.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYS Department of Environmental Conservation, *Niagara River Area of Concern Beneficial Use Impairment Removal Fish Tumors or Other Deformities*, October 2015

This report outlines the available data addressing the status of the Beneficial Use Impairment (BUI), fish tumors and other deformities and suggests removing this BUI due to the data presented.

Draft located here: http://www.dec.ny.gov/docs/regions_pdf/nrftbui.pdf

Niagara River Data Interpretation Group to the River Monitoring Committee, *Joint Evaluation of Upstream/Downstream Niagara River Monitoring Data for the Period April 1989 to March 1990, March 1992*

Canada, the United States, New York State, and the Province of Ontario undertook a monitoring program at the head and mouth of the Niagara River. The results from water samples and suspended solids are described in this report.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

Niagara River Toxics Committee, *Report of the Niagara River Toxics Committee*, October 1984

The first coordinated study on toxic chemicals entering the Niagara River, conducted by Canadian and United States environmental agencies.

-Contact Mark Filipski at NYS Department of Environmental Conservation to view a copy. (716) 851-7000

Niagara County Department of Planning, Development & Tourism; *Cayuga Creek Management Study, Niagara County NY*; August 1997

This report is a compilation of information intended to assist in the development of a program to improve conditions currently associated with Cayuga Creek. Each section discusses a separate issue and includes relevant information. It is suggested that the City of Niagara Falls address tree and debris removal along both banks of Cayuga Creek.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Niagara River Corridor IBA Working Group, *Important Bird Area Conservation Plan*, Fall 2002

The Niagara River is an international waterway that is important for annual gathering of birds. There are four species that exist here in globally significant numbers and supports one of the largest and most diverse concentrations of gulls in the world. These congregations have led to the Niagara River Corridor being designated a globally significant Important Bird Area (IBA). The plan describes the Niagara River Corridor IBA, focusing on the globally and nationally important bird species and the potential challenges they may have. This is followed by a series of goals and objectives that will aid in the conservation of these species and the habitat that supports them.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Niagara River Greenway Commission, *Niagara River Greenway Plan and Final Environmental Impact Statement*, April 2004

The Plan establishes a unified vision and a set of principles for the Niagara River Greenway. It identifies the assets and resources that make up the Greenway, sets priorities that suggests the types of activities to target in the near term, and identifies potential funding sources, partnerships and linkages. The Plan also discusses several high priority implementation concepts that describe system wide approaches and strategies for Greenway development.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Niagara River Remedial Action Plan, *Charting A Course to Delisting-Niagara River (Ontario) AOC Update 2010*

The update summarizes and reviews the current status of Area of Concern issues, review of the Stage 2 Report and its outcomes, and what remains to be done for AOC delisting.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

The Niagara River Secretariat, *Niagara River Toxics Management Plan (NRTMP) Progress Report and Work Plan*, October 2007

This report summarizes progress made by the four parties in dealing with the 18 priority toxics through reductions in point and non-point sources to the Niagara River. The report also discusses other initiatives that are pertinent to the Niagara River.

Overall, the water quality of the river has improved significantly since the inception of the NRTMP in 1987. Based on a review of the most current trend information, the original goal of 50% reduction in the concentration of 10 of the 18 priority toxics either have been met or exceeded. Despite this success, more work is needed to further reduce those compounds whose concentrations continue to statistically exceed the most stringent agency criteria or standards.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Scajaquada Creek Watershed Advisory Council, *Watershed Management Plan*, February 2004

The Plan provides watershed management goals, objectives and action items to restore and protect the ecological quality of the watershed. These can be achieved through municipal capital improvement projects, grant funded programs and community service projects. Because Scajaquada Creek is located in a heavily developed and has been greatly manipulated, water quality, hydrologic regime, wildlife habitat and overall stream health have been degraded.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

SUNY College at Buffalo-Dr. Shreeram Inamdar, *Assessment of PCB Contamination in Scajaquada Creek GLNPO Proposal*, 2002

An assessment of the extent of PCB contamination in the waters and sediments of Scajaquada Creek was proposed. PCB contamination is a concern because fish in the Creek have been reported to have the highest PCB concentrations of all sampled Niagara River tributaries.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Niagara River Area of Concern (AOC) Strategic Plan for Beneficial Use Impairment (BUI) Delisting*, March 2011

This report recommends a series of actions, projects and programs to improve relevant conditions in the Niagara River Area of Concern and documents restoration and protection of beneficial uses in support of the eventual delisting or re-designation of this AOC.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Draft Niagara River, New York Initial Watershed Assessment*; September 2010

This document presents the results of a preliminary assessment of watershed problems, needs and opportunities in the Niagara River watershed. It recommends, based on sponsor and stakeholder support shown to date, that a Watershed Assessment Management Plan be developed to conduct a comprehensive detailed Niagara River watershed assessment.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *The Cayuga Creek Watershed Restoration Roadmap*, March 2009

This report represents the synthesis of known and available information regarding the known impairments within the watershed, and provides solutions and projects that will improve the health of the watershed. The ultimate goal of the roadmap is to outline a path that leads to a healthy Cayuga Creek watershed. Persistent environmental contamination and pervasive habitat alterations within the watershed leads to issues regarding issues of human health, resource management, ecological integrity and sustainability, and outdoor recreational opportunities.

<http://bnriverkeeper.org/wp-content/uploads/2014/06/Cayuga-Creek-Watershed-Restoration-Road-Map.pdf>

U.S. Army Corps of Engineers Buffalo District, *Tuscarora Nation 905(b) Reconnaissance Study*, 2005

This analysis assessed ways to identify and preserve Tuscarora and Haudenosaunee cultural resources such as sites and artifacts on tribal lands within the Niagara River region. Documentation of the significance and integrity of these resources is necessary to ensure appropriate restoration, protection and management.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Cayuga Creek, Niagara County, NY-Flooding and Related Water Resources*, March 2002

The purpose of this study is to determine if there is a federal interest in developing a plan for flood damage reduction in the Town of Niagara in the vicinity of Cayuga Village Trailer Park. The study also evaluates other water resources related problems and needs within the Cayuga Creek basin. Further comprehensive study of the watershed will be pursued cooperatively with the Niagara County Department of Planning, Development and Tourism.

http://www.worldcat.org/title/cayuga-creek-niagara-county-new-york-flooding-and-related-water-resources-section-905b-wrda-86-analysis-reconnaissance-report/oclc/436459593&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Buffalo Harbor, NY Commercial Navigation Study*; 2004

The most comprehensive USACE study of the Niagara River corridor was conducted in the early 1980's. That study investigated the feasibility of making commercial navigation improvements to the Buffalo Harbor to support increased or modified commercial activities. The study also considered improvements in recreation, environmental quality and water quality in the harbor area. None of the study recommendations were implemented.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Flood Control on Scajaquada Creek and Tributaries-Draft Environmental Statement*, September 1974

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *History of Niagara River*, revised 1941

The report includes: a general history of the Niagara River, a summary Army Corps reports, documents and authorizations; summary of federal improvements and costs, summary of local cooperation and improvements, River commercial statistics, and maps.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Hoyt Lake and Scajaquada Creek Sediment Sampling and Analysis Report*, April 2014

Buffalo Olmsted Parks Conservancy requested assistance with sediment sampling within and around Hoyt Lake in Delaware Park.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Low-Head Hydropower Generation on the Niagara River Section 905(b) (WRDA 86) Analysis Reconnaissance Report*, August 2012

This analysis is the preliminary determination of the economic, engineering and environmental viability of alternative plans to address the engineering, economic and environmental viability of installing small-scale hydropower facilities on the Niagara River.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Niagara River Diversion: Volume I-Instructions, Volume II-Rating Tables*; May 1938

The information, instructions, and data contained in the report govern the procedure in supervising and measuring the diversion of water for the generation of hydroelectric power from the Niagara River in the vicinity of Niagara Falls. These instructions were published in two volumes.

http://www.worldcat.org/title/instructions-governing-supervision-of-water-diversion-from-the-niagara-river-for-the-generation-of-hydro-electric-power/oclc/607315768&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Niagara River Remedial Works and St. Lawrence Seaway*, August 1955

The Niagara River remedial works serve two purposes: to change the river flow and to have a better distribution of flow along the crest of the Falls, especially at low flows. The remedial works are excavation near the shore of Goat Island and fill at the tip of the island, excavation near the Canadian

shore and fill at the crest of the Falls, and construction of a gated control structure about one mile upstream from the Falls.

http://www.worldcat.org/title/inspection-of-site-niagara-river-remedial-works-and-st-lawrence-seaway-17-19-august-1955/oclc/456412498&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Review of Reports on Niagara River, Black Rock Channel, Tonawanda and Buffalo Harbors-Redevelopment for Power: Volume I-Main Report, Volume II-Appendices*; October 1954

The District Engineer recommends that Congress approve the general plan proposed in this report for power redevelopment comprising of a new high head development at Lewiston, supplemented by a pumped storage reservoir to utilize the additional waters made available by the 1950 treaty between the United States and Canada.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Report on High Water and Ice Conditions, January-April 1964, Upper Niagara River*; June 1964

This report details the high water conditions in the upper Niagara River.

http://www.worldcat.org/title/report-on-high-water-and-ice-conditions-january-april-1964-upper-niagara-river/oclc/456414427&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Reconnaissance Report-Shoreline Protection Along Lake Erie and Niagara River*, December 1987

This study is limited to addressing the needs for flood damage reduction. Other authorized study purposes for beach erosion control and shoreline protection improvements for other than flood damage protection are primarily for recreational opportunities. No investigations were undertaken regarding beach erosion control for Strawberry Island.

http://www.worldcat.org/title/reconnaissance-report-buffalo-metropolitan-area-ny-erie-county-along-lake-erie-and-niagara-river-shoreline-protection-interim/oclc/456297305&referer=brief_results

U.S. Environmental Protection Agency, *Niagara River Action Plan*, May 1986

The Niagara River Action Plan consists of the several major programs EPA has already ongoing under the Clean Water Act, the Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation and Liability Act, combined with a number of specific new initiatives to respond to gaps identified in the report of the Niagara River Toxics Committee.

<http://bit.ly/2qNIF3o>

U.S. Environmental Protection Agency, *Overview of Environmental Pollution in the Niagara Frontier*, New York, March 1982

Provides an objective overview of available information on environmental conditions, sources of chemical substances, and regulatory programs to control these substances. The study primarily concentrated on the Buffalo and Niagara Falls urban areas. Available information in published literature and in State and Federal agency files was compiled through an extensive literature search and file review.

<http://bit.ly/2rcoz2g>

U.S. Environmental Protection Agency and Environment Canada, *Niagara River Toxics Management Plan (NRTMP) Progress Report and Work Plan*, September 2005

The focus should continue to be on those priority toxics that already exceed their strictest agency criterion, and that have Niagara River sources that may be contributing to these exceedances. The data indicates these toxics are mirex, HCB and PAHs. The report identifies some other issues listed below that warrant further consideration.

- Possible amendments to the list of NRTMP 18 priority toxics,
- A mechanism for addressing new and emerging chemicals,
- Mechanisms for addressing the upstream sources of priority toxics that already exceed their strictest agency criteria in the water entering from Lake Erie, and
- The interrelationships between the Lake Ontario and Lake Erie Lakewide Action and Management Plans and the NRTMP.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Environmental Protection Agency and NYS Department of Environmental Conservation, *Reduction of Toxic Loadings to the Niagara River from Hazardous Waste Sites in the United States: Annual Status Report*, 1998-2000, 2002-2005, 2007-2010, 2012-2013.

In a 1988 study report, 33 hazardous waste site clusters were identified and prioritized in order of potential for toxic pollutant loadings to the Niagara River. The complete remediation of these sites became the primary focus of the Niagara River Toxics Management Plan.

<https://www.epa.gov/niagara-river-aoc/niagara-river-toxics-management-plan-annual-status-reports>

2005:<http://bnriverkeeper.org/wp-content/17->

[USEPA%20and%20NYSDEC%202005 ToxicLoadingsWasteSites.pdf](http://bnriverkeeper.org/wp-content/17-USEPA%20and%20NYSDEC%202005%20ToxicLoadingsWasteSites.pdf)

U.S. Environmental Protection Agency Region II in conjunction with New York State Department of Environmental Conservation, *Niagara River Action Plan – August 1987 Update*, August 1987

Provides the status of specific environmental studies and regulatory programs being undertaken on the U.S. side of the Niagara River to address pollution problems in the area.

<http://bit.ly/2pR10Zb>

Water Issues Division, Environment Canada-Ontario Region; *The Niagara River Digital Atlas*, March 1996

The purpose of the Atlas was to provide data integration and visualization support to Niagara River environmental programs. The Atlas is a database that integrates different types of mostly Canadian information in GIS maps. Information contained in the Atlas includes base mapping data, contaminant loadings from industrial and municipal facilities. Water quality monitoring, and bio-monitoring of fish and mussels.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

SIX MILE CREEK SUB-WATERSHED

This sub-watershed includes Twentymile Creek in Chautauqua County.

Chautauqua County Department of Health Division of Environmental Health Services, *Safe Yield Study of Belson Creek*, date unknown

The safe yield of a stream is the quantity of water available for use during the period of lowest stream flow. Belson Creek is the Town of Ripley's sole source of public water.

-Contact Erie County Department of Environment and Planning at (716) 858-6370 to view a copy in Room 1083

SMOKE(S) CREEK SUB-WATERSHED

Erie County Health Department, *Final Report Erie County, NY Lake Erie Stream Sanitary Surveys Project (GL-97219100)*, January 2015

This report discusses the findings of beach sanitary surveys at Lake Erie Beach, Evans Town Beach, Bennett Beach, Wendt Beach, Hamburg Town Beach, and Woodlawn Beach. Sampling was also conducted in the following streams: Muddy Creek, Delaware Creek, Big Sister Creek, Little Sister Creek, and Berricks Creek.

-Contact Erie County Health Department at (716) 961-6800

Town of Hamburg, *Local Waterfront Revitalization Program*, July 2012

This includes portions of Eighteenmile Creek and Smokes Creek sub-watersheds. An inventory and analysis of existing features includes natural resources is outlined. Policies for development are also included in the report.

http://www.townofhamburgny.com/Hamburg_LWRP_Amendment.pdf

SUNY Buffalo School of Architecture and Planning, *Lackawanna in A Time Of Transition*, Spring 1994

During the spring of 1994, a joint project between graduate architecture and urban planning students from SUNY at Buffalo assisted the City of Lackawanna in exploring potential visions for its new master plan. They examined the city's present conditions and developed ideas for what Lackawanna could become, including the Lake Erie water front area.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Flood Plain Information Report-City of Lackawanna*, February 1965

Report was done to provide planners and city officials with technical information on possible future flooding from Smokes Creek. With this information legislation can be drawn up for the control of land use within the flood plain. Regulations should be carefully drawn up on the basis of flood risk and land use needs.

http://www.worldcat.org/title/flood-plain-information-report-smokes-creek-city-of-lackawanna-new-york/oclc/4129691&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Design Memorandum on Local Flood Protection*, June 1963

The authorized flood control project at Smokes Creek provides for: jetties at the mouth, channel rectification on the main stream between Lake Erie and the junction of the north and south branches, appropriate streambed and side slope protection, relocation of buildings, adjustment of utilities, and alteration of bridges.

http://www.worldcat.org/title/design-memorandum-on-local-flood-protection-smokes-creek-at-lackawanna-new-york/oclc/319886908&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Review of Report on Smokes Creek-Lackawanna*, 1958

Flood waters from Smokes Creek caused severe damage in Lackawanna in 1953 and 1955 and less severe damage in 1956. The most practical plan of improvement would consist of channel enlargement by deepening and widening of the main stream and its two branches. Extensive alteration of bridges and utility crossings would be necessary.

http://www.worldcat.org/title/review-of-report-on-smokes-creek-in-the-vicinity-of-lackawanna-new-york-for-flood-control-survey/oclc/318901196&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Smokes Creek Relocation – Section 1135 Hydraulic Analyses City of Lackawanna, New York*, date unknown

A hydraulic analysis was performed to assess the preliminary plan to relocate Smokes Creek from the mouth of the creek at Lake Erie to approximately 4000 feet upstream from the mouth.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Preliminary Examination Report on Flood Control*, February 1941

Further improvement of the channels in the city or a system of reservoirs upstream would eliminate flooding, but the actual flood damage that occurs is insufficient to justify the construction of either plan. A survey is not recommended.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

TONAWANDA CREEK WATERSHED

Erie-Niagara Basin Regional Water Resources Planning and Development Board, *Flood Plain Information-Tonawanda Creek and its Affected Tributaries*, August 1967

This flood plain information report is for Tonawanda, lower Ransom, Black and Mud Creeks in Erie and Niagara Counties. It was intended to provide planners and local governments with technical information on the largest known floods of the past and data on possible future floods. It was recommended that these possible future floods be considered when development within the flood plain is planned. It also provides a basis for effective and workable legislation for the control of land use within the flood plain.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Tonawanda Creek, NY Section 905(b) Reconnaissance Study*, September 2005

The purpose of this reconnaissance study was to review previous USACE reports for Tonawanda Creek to determine if a federal and non-federal interest existed for developing plans for flood damage reduction, environmental restoration and other purposes in the watershed. There was an interest in advancing the watershed study to the feasibility phase but no federal funds were available for the study.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Final Feasibility Report on Flood Management, Final Environmental Impact Statement, and Appendices*, July 1983

The Army Corps was asked to review reports on Tonawanda Creek to determine the feasibility of providing flood protection. The major water resource problem is flooding and local interests desire solutions that will minimize adverse economic and environmental impacts. The report recommends the construction of two floodwater detention reservoirs upstream of the City of Batavia.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Feasibility Report on Flood Management-Main Report and Appendices*, November 1981

The purpose of the study was to develop and evaluate alternative plans to provide for flood and flood related management needs. The first phase of the study identified all significant flood and flood related management needs. Measures that met these needs were then identified and evaluated. Alternative plans were then evaluated and those that appeared viable were recommended for further study. During the second phase those plans recommended for further study, and alternative plans introduced after the first phase were evaluated. The optimum plan was recommended for implementation. This report presents the findings of the second study phase. It also provides a summary of prior studies and reports done by the U.S. Army Corps of Engineers.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Flood Management Study-Final Feasibility Report, Main Report*, December 1980; *Technical Report*, 1980; *Appendices*, November 1979; *Final Environmental Impact Statement*,

The purpose of the study was to develop and evaluate alternative plans to provide for flood and flood related management needs. The technical report contains the following technical appendices: hydrology and hydraulics, flood damages and management benefits, cost estimates for alternative plans, selected plan, geotechnical plan, geotechnical design, non-structural base plan, and public input.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Agricultural Activity Study-Supplemental Report*, 1978

Agriculture is a significant land use in the watershed. Major areas of investigation in this study were: crop patterns, seasonal effects, intensity and cost-revenue functions. This data was used to develop flood stage damage relationships by reach.

http://www.worldcat.org/title/tonawanda-creek-watershed-agricultural-activity-study-supplemental-report/oclc/608269022&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, Finding of No Significant and Environmental Assessment U.S. Army Corps of Engineers Aquatic Plant Control Research Program Section 104, River and Harbor Act of 1958 Tonawanda Creek/Erie Canal Hydrilla Control Demonstration Project Cities of Tonawanda, North Tonawanda, & Lockport Erie & Niagara Counties, New York, July 2014

There is a narrow window of opportunity to prevent the spread of hydrilla and eradicate the infestation in the Erie Canal/Tonawanda Creek. However, this section of the Erie Canal has abundant native submersed vegetation that is intermixed with hydrilla. The purpose of this demonstration project is to develop selective control methods to manage the monoecious biotype of hydrilla in a flowing water system while minimizing impact to native vegetation.

-Contact U.S. Army Corps of Engineers Buffalo District at (716) 879-4104

U.S. Army Corps of Engineers Buffalo District, *Interim Flood Management Study-Final Feasibility Report, Main Report and Appendices*, 1976

The purpose of the study was to develop and evaluate alternative plans to provide for flood and flood related management needs. The first phase of the study identified all significant flood and flood related management needs. Measures that met these needs were then identified and evaluated. Alternative plans were then evaluated and those that appeared viable were recommended for further study. During the second phase those plans recommended for further study, and alternative plans introduced after the first phase were evaluated. The optimum plan was recommended for implementation. The appendices contain information on hydrology and hydraulics, flood damages and management benefits, cost estimates for alternative plans, selected plan, and the non-structural base plan.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

LOWER TONAWANDA CREEK SUB-WATERSHED

Buffalo State College-Watershed Analysis Group, *Gott Creek-Stream System Background and Classification, Stream Visual Assessment Protocol, and Stability Threshold Analysis*; December 2005

A classification, visual assessment, and stability analysis of Gott Creek were conducted based on stream bank erosion in the Town of Clarence. The primary purpose was to gather qualitative data on Gott Creek to assess stream bank stability.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Erie and Niagara Counties Regional Planning Board, *Section 208 Water Quality Management Program, Report 7, Water Quality Data, Stream Sampling and Modeling, Volume I*; January 1979.

The report was intended to identify water quality problems in the two county region. Water quality sampling occurred during the fall 1976 and the summer of 1977. To supplement the chemical/physical data a series of benthic macro invertebrate samples were taken. These samples were used to assess long term environmental stream conditions.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Gomez and Sullivan Engineers, *Mapping of Aquatic and Riparian Habitat of Ellicott and Tonawanda Creeks, and Tributaries to Tonawanda Creek*, NYPA, August 2005.

Aquatic habitats in the lower reaches of Ellicott and Tonawanda Creeks are turbid runs that have been dredged, especially the last 11.6 miles of Tonawanda Creek, and part of the Barge Canal which runs backwards 6 months of the year (May-October) and is dredged to a uniform width, depth and slope. Flood control, dredging and diversion channels have also severely interrupted natural habitat on lower Ellicott Creek. Upper reaches of both creeks are more sinuous with greater habitat variability (run/riffle). Water levels in these creeks and their tributaries (Mud, Ransom, Black, Bull, Sawyer) are potentially influenced by Niagara River water levels.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Report on Feasibility of Flood Management in the Buffalo River/Lower Tonawanda Creek-Draft Feasibility Report and Draft Environmental Impact Statement*, January 1990

Army Corps conducted two separate and independent investigations for flood management on the Buffalo River and Lower Tonawanda Creek. The Lower Tonawanda Creek study investigated in detail public concerns regarding flooding and various potential alternative flood damage reduction measures. Of 13 plans initially considered, two were selected for detailed study. The NYS Department of Environmental Conservation indicated it could not commit to supporting any plan at that time. The study was terminated based on the lack of support for a plan.

http://www.worldcat.org/title/interim-report-on-feasibility-of-flood-management-in-the-buffalo-metropolitan-area-ny-buffalo-riverlower-tonawanda-creek/oclc/477254264&referer=brief_results

U.S. Fish and Wildlife Service, *Biological Study Report for Tonawanda, Black and Ransom Creeks*, 1988

This study was centered around the general vicinity of Ransom and Black Creeks in the Town of Amherst, and a portion of Tonawanda Creek in the Towns of Amherst and Clarence. Beeman Creek was sampled for comparative purposes. Fish species and benthic invertebrates were sampled and collected. Sampling of water quality parameters was also done.

http://www.worldcat.org/title/biological-study-report-for-tonawanda-black-and-ransom-creeks-erie-county-new-york/oclc/431419530&referer=brief_results

URS Corporation, *Town of Amherst-Flood Mitigation Plan Report Draft*, December 2001

The study focused on the following primary flooding sources: Ellicott Creek, Tonawanda Creek, Ransom Creek, French Creek, Black Creek, and Gott Creek. Historic flood problems were reviewed, flooding causes were identified, and problems assessed as it affects specific structures or classes of structures. Also identified were flood mitigation measures that were evaluated with budgetary cost estimates prepared.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

MIDDLE TONAWANDA CREEK SUB-WATERSHED

NYS Department of Environmental Conservation, *Biological Stream Assessment-Tonawanda Creek, Genesee County*; April 1993

The Creek was sampled after the City of Batavia's wastewater treatment system was upgraded. Water quality downstream of the system's discharge was substantially improved from conditions documented in 1984 and 1988. Water quality upstream of the discharge was assessed as slightly impacted, possibly by nonpoint sources.

http://www.worldcat.org/title/biological-stream-assessment-tonawanda-creek-genesee-county-new-york/oclc/45673074&referer=brief_results

NYS Department of Health, *Biological Survey of the Tonawanda Creek*, 1970

In August 1969 a biological survey of Tonawanda Creek between Batavia and North Pembroke was conducted. The Creek exhibited signs of organic pollution and progress toward natural recovery along the 14-mile reach between Batavia and North Pembroke.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

NYS Department of Health, *Rapid Biological Stream Assessment, Tonawanda Creek Above and Below Batavia STP*; December 1984

In July 1984 7 sites were sampled on Tonawanda Creek, Genesee County to assess the impact of the Batavia sewage treatment plant on water quality. Tonawanda Creek is organically enriched even upstream of the Batavia STP discharge, 7 miles upstream water quality is slightly impacted, while immediately upstream water quality is moderately impacted. The Batavia STP discharge has an immediate detrimental impact on the biota. Recovery from the sewage pollution is evident 7.6 miles below the STP discharge but there remains organic enrichment and a heavy silt load.

http://www.worldcat.org/title/rapid-biological-stream-assessment-tonawanda-creek-above-and-below-batavia-stp/oclc/45672928&referer=brief_results

UPPER TONAWANDA CREEK SUB-WATERSHED

Field Examination Report-Upper Tonawanda Creek Watershed, author and publication date unknown but likely late 1950's

Contains information about the suitability of the watershed as a project under the Watershed Protection and Flood Prevention Act.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Special Flood Hazard Evaluation Report-Village of Attica*, March 2000

This report presents local flood hazard information for Tonawanda Creek in the Village of Attica, NY. Interpretation in the application of the data contained in this report as applied to its use in developing effective flood plain regulations. Changes in hydrology and hydraulics reflected in this study are the results of a more detailed analysis, primarily new procedures and additional flow data. The Prospect

Road vicinity was more accurately modeled and flows introduced by Tannery Brook were accounted for in this study.

http://www.worldcat.org/title/special-flood-hazard-evaluation-report-tonawanda-creek-village-of-attica-wyoming-county-new-york/oclc/891183910&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Special Flood Hazard Evaluation Report-Town and Village of Alexander, Town and Village of Attica*; October 1984

This report investigates the potential flood situation along Tonawanda Creek from the downstream municipal limits in the Village of Alexander upstream to where Route 98 crosses the Creek in the Town of Attica. Although large floods have occurred, studies indicate that even larger floods are possible. According to historical records most of the floods in the Tonawanda Creek watershed have been caused by snowmelt augmented by rainfall.

http://www.worldcat.org/title/special-flood-hazard-evaluation-report-tonawanda-creek-town-of-alexander-village-of-alexander-town-of-attica-village-of-attica-genesee-and-wyoming-counties-new-york/oclc/54812886&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Special Flood Hazard Evaluation Report-Town of Batavia*, February 1983

This report investigates the potential flood situation along Tonawanda Creek in the Town of Batavia, west of the City of Batavia's municipal limits. Most of the area along the creek is agricultural or residential. Although large floods have occurred, studies indicate that even larger floods are possible. The report includes a history of flooding and identifies those areas that are subject to possible future floods. Past flooding has occurred generally in the late winter or early spring and has been caused by snowmelt augmented by rain fall. Major flooding caused by ice jams has been rare.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Final Environmental Impact Statement-Regional Flood Control, Genesee County*; November 1979 and November 1981

The recommended project consists of two shallow detention reservoirs arranged in series, and located on Tonawanda Creek between the Village of Alexander and the City of Batavia. Snags and debris jams in the main channel between the two dams would be removed. Beneficial and adverse environmental impacts were identified and evaluated.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Interim Review of Report for Flood Control-Tonawanda Creek in the Vicinity of Batavia*, 1961

Over a five-year period there have been 3 floods greater than and one nearly equal to the flow for which the completed project on Tonawanda Creek at Batavia was designed. There has been appreciable damage and emergency work has been necessary to prevent disastrous flooding. The most practical plan of improvement would include a downstream extension of the existing improved channel, raising and extending an existing levee, and bank protection and alteration of drainage structures.

https://books.google.com/books/about/Interim_Review_of_Report_for_Flood_Contr.html?id=2NwBtwAACAAJ

U.S. Army Corps of Engineers Buffalo District, *Reconnaissance Report on Tonawanda Creek at Batavia for Flood Control Improvement*, December 1957

The reports purpose was to determine whether a detailed study would be warranted with the objective of developing a flood control project.

http://www.worldcat.org/title/reconnaissance-report-on-tonawanda-creek-at-batavia-new-york-for-improvement-for-flood-control-under-ublic-law-685-84th-congress/oclc/407023120&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Design Memorandum on Local Flood Protection-Tonawanda Creek Batavia*, November 1953

The project plan consists of channel widening for 2 miles downstream from the municipal dam in Batavia. http://www.worldcat.org/title/design-memorandum-on-local-flood-protection-tonawanda-creek-batavia-new-york/oclc/320776093&referer=brief_results

U.S. Army Corps of Engineers Buffalo District, *Review of Reports on Tonawanda Creek*, August 1945

Local interests request provision of protective works to prevent flood damage in Tonawanda Creek in the City of Batavia, and the agricultural area between the Tonawanda Indian Reservation and the mouth of Ransom Creek. It was recommended that a federal project for local flood protection at Batavia be adopted.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Plan of Survey for Review of Reports on Tonawanda Creek*, January 1945

This report describes the nature of the flood problem, the data available, improvements to be considered and the scope and procedure of field and office studies proposed for the review report on Tonawanda Creek.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

U.S. Army Corps of Engineers Buffalo District, *Plan of Survey for Tonawanda Creek*, February 1943

Proposed general plan of survey for flood control of Tonawanda Creek.

http://www.worldcat.org/title/plan-of-survey-for-tonawanda-creek-new-york/oclc/413621276&referer=brief_results

U. S. Geological Survey, *Geohydrology of the Glacial-Outwash Aquifer in the Batavia Area, Tonawanda Creek, Genesee County, New York*, 1984

Seven plates showing land use, well yield, potentiometric surface, aquifer thickness, water-infiltration potential of soil zone, geologic sections, and surficial geology are shown for the area near the village of Batavia.

<https://pubs.er.usgs.gov/publication/wri854096>

U.S. Geological Survey, *Ground Water in Dale Valley, NY*

Dale Valley contains two gravel aquifers that are potential sources of small industrial or community water supplies. Long term withdrawals from this aquifer are limited by slow recharge through surrounding fine grained materials. Water high in chloride has migrated into parts of the Dale Valley

aquifer. Chloride concentrations in one area seem to be increasing. Continued increase would render the water unsuitable for many purposes.

-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

Wyoming County Soil & Water District, *Tonawanda Creek-Fluvial Geomorphic Assessment*, January 2009

PARISH Geomorphic Ltd. undertook the first phase of a watershed assessment that entailed a desktop assessment of the watershed that included the following tasks: a background review of existing information, assessment of historic channel adjustments, assessment of basin morphometrics and reach delineation, reach characterization and sensitivity analysis, and development of a work plan that outlines the next steps in a watershed assessment.

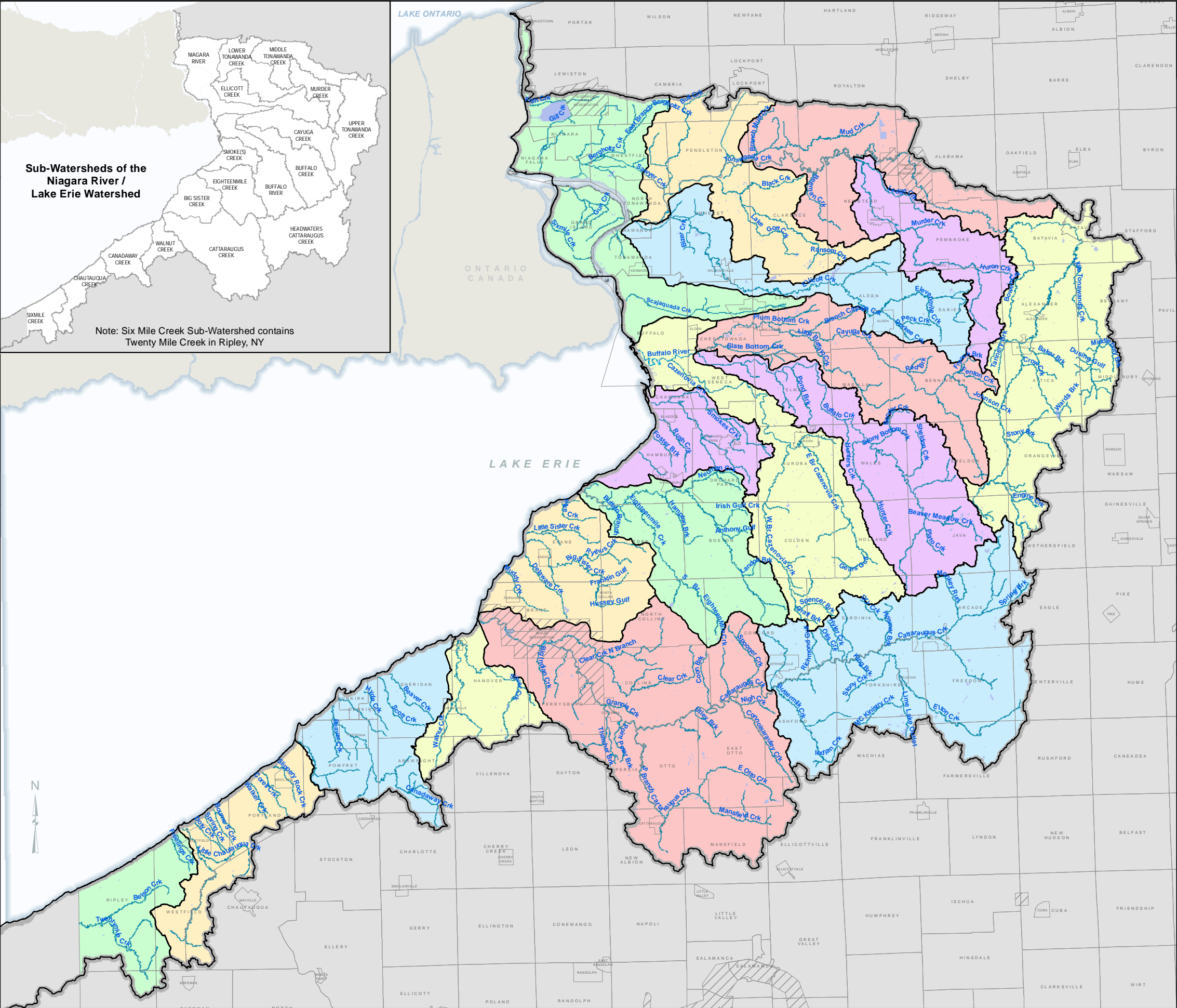
-Contact Buffalo Niagara Riverkeeper to view a copy. (716) 852-7483

WALNUT CREEK SUB-WATERSHED

U.S. Geological Survey, *Flash Floods of August 10, 2009, in Villages of Gowanda and Silver Creek, New York*, 2010

This report describes the weather conditions that led to the floods and the aftermath. It lists high-water marks and annual exceedance probability for the storm levels in the area.

<http://pubs.usgs.gov/sir/2010/5259/pdf/SIR%202010-5259.pdf>



Regional Niagara River / Lake Erie Watershed Management Plan

SUB-WATERSHEDS AND MAJOR WATERWAYS OF THE NIAGARA RIVER / LAKE ERIE WATERSHED

List of Sub-Watersheds

- Big Sister Creek
- Buffalo Creek
- Buffalo River
- Canadaway Creek
- Cattaraugus Creek
- Cayuga Creek
- Chautauqua Creek
- Eighteenmile Creek
- Ellicott Creek
- Headwaters Cattaraugus Creek
- Lower Tonawanda Creek
- Middle Tonawanda Creek
- Murder Creek
- Niagara River
- Sixmile Creek
- Smoke(s) Creek
- Upper Tonawanda Creek
- Walnut Creek

Sub-Watershed Boundary

County

Project Area

Municipality

Indian Reservation

Waterways

52.50510

Miles

52.50510

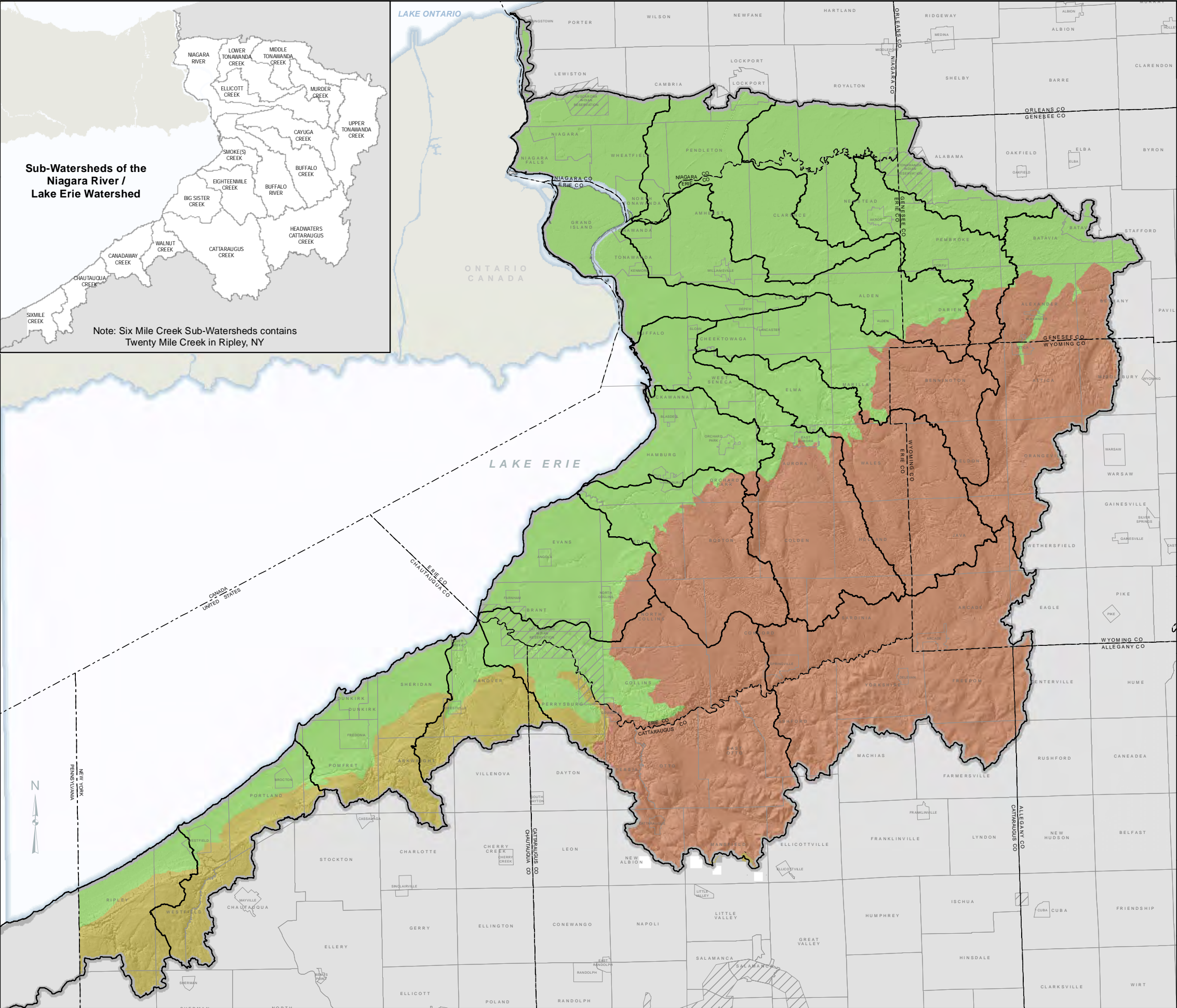
Kilometers

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Waterways are based on the 2016 U. S. Geological Survey National Hydrography Dataset (NHD)

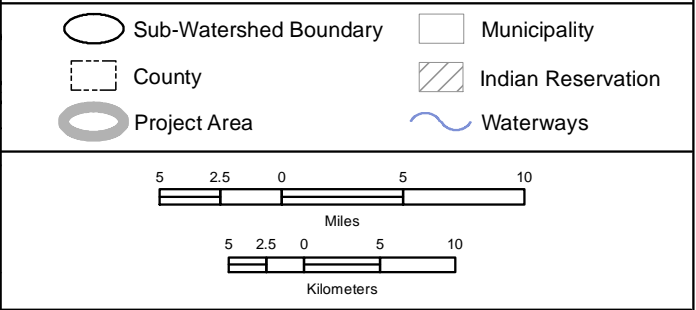
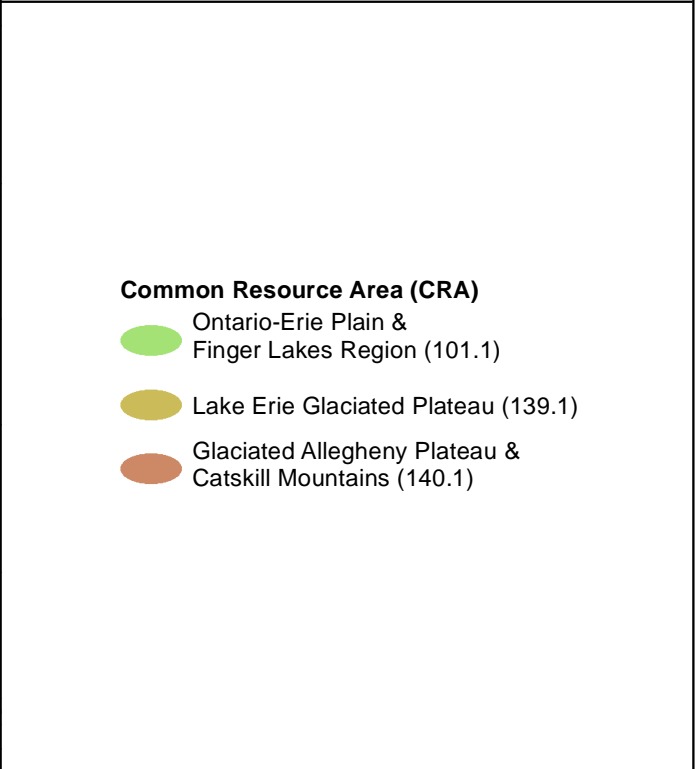
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Regional Niagara River / Lake Erie Watershed Management Plan

COMMON RESOURCE AREAS



Landscape conditions, soil, climate, and other considerations are used to define Common Resource Area (CRA) geographic boundaries. CRA data is created by USDA NRCS and obtained through USDA Geospatial Data Gateway's National Soil Survey Center, 2004.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017

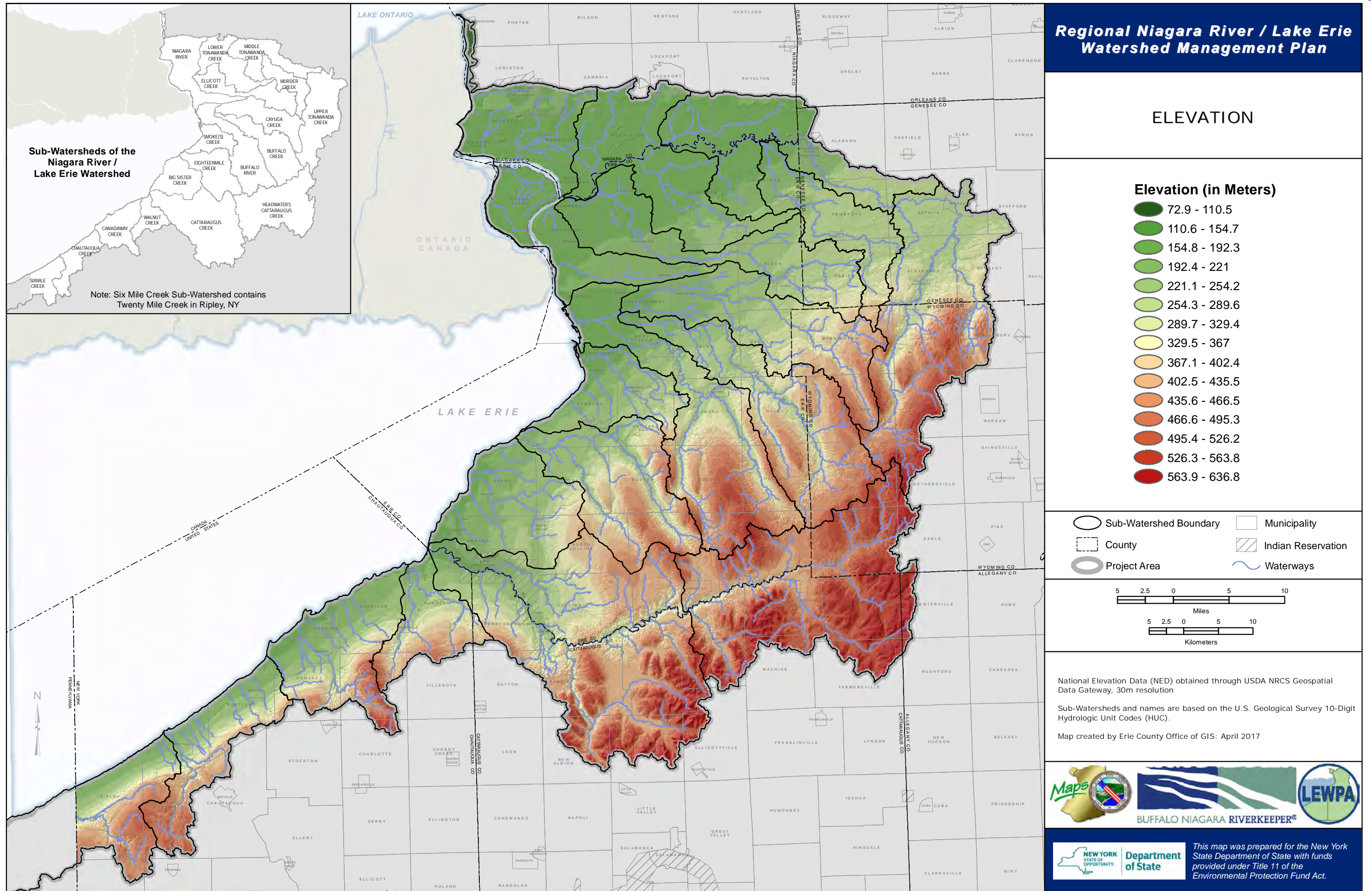


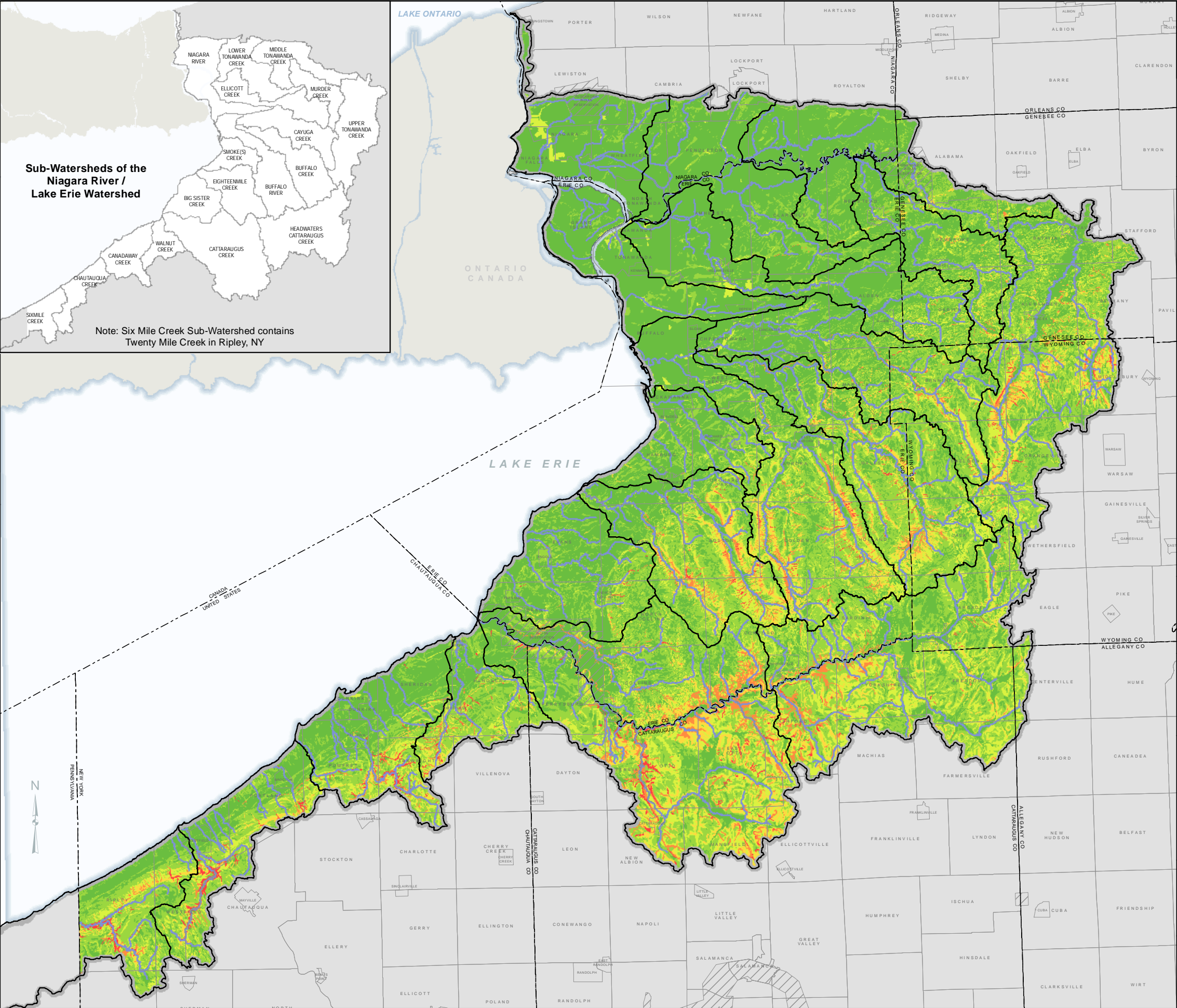
BUFFALO NIAGARA RIVERKEEPER®



Department of State

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Sub-Watersheds of the Niagara River / Lake Erie Watershed

NIAGARA RIVER
LOWER TONAWANDA CREEK
MIDDLE TONAWANDA CREEK
ELLCOTT CREEK
MURDER CREEK
CAYUGA CREEK
UPPER TONAWANDA CREEK
SMOKE(S) CREEK
EIGHTEENMILE CREEK
BUFFALO RIVER
BIG SISTER CREEK
HEADWATERS CATTARAUGUS CREEK
CANADAWAY CREEK
WALNUT CREEK
CATTARAUGUS CREEK
CHAUTAUQUE CREEK
SIXMILE CREEK

Note: Six Mile Creek Sub-Watershed contains Twenty Mile Creek in Ripley, NY

Regional Niagara River / Lake Erie Watershed Management Plan

SLOPE

Slope Class

- Nearly Level (0% - 2%)
- Gently Sloping (3% - 7%)
- Strongly Sloping (8% - 14%)
- Moderately Steep (15% - 24%)
- Steep (25% - 34%)
- Very Steep (35% and greater)

○ Sub-Watershed Boundary □ Municipality

▭ County ▨ Indian Reservation

○ Project Area ~ Waterways

5 2.5 0 5 10
Miles

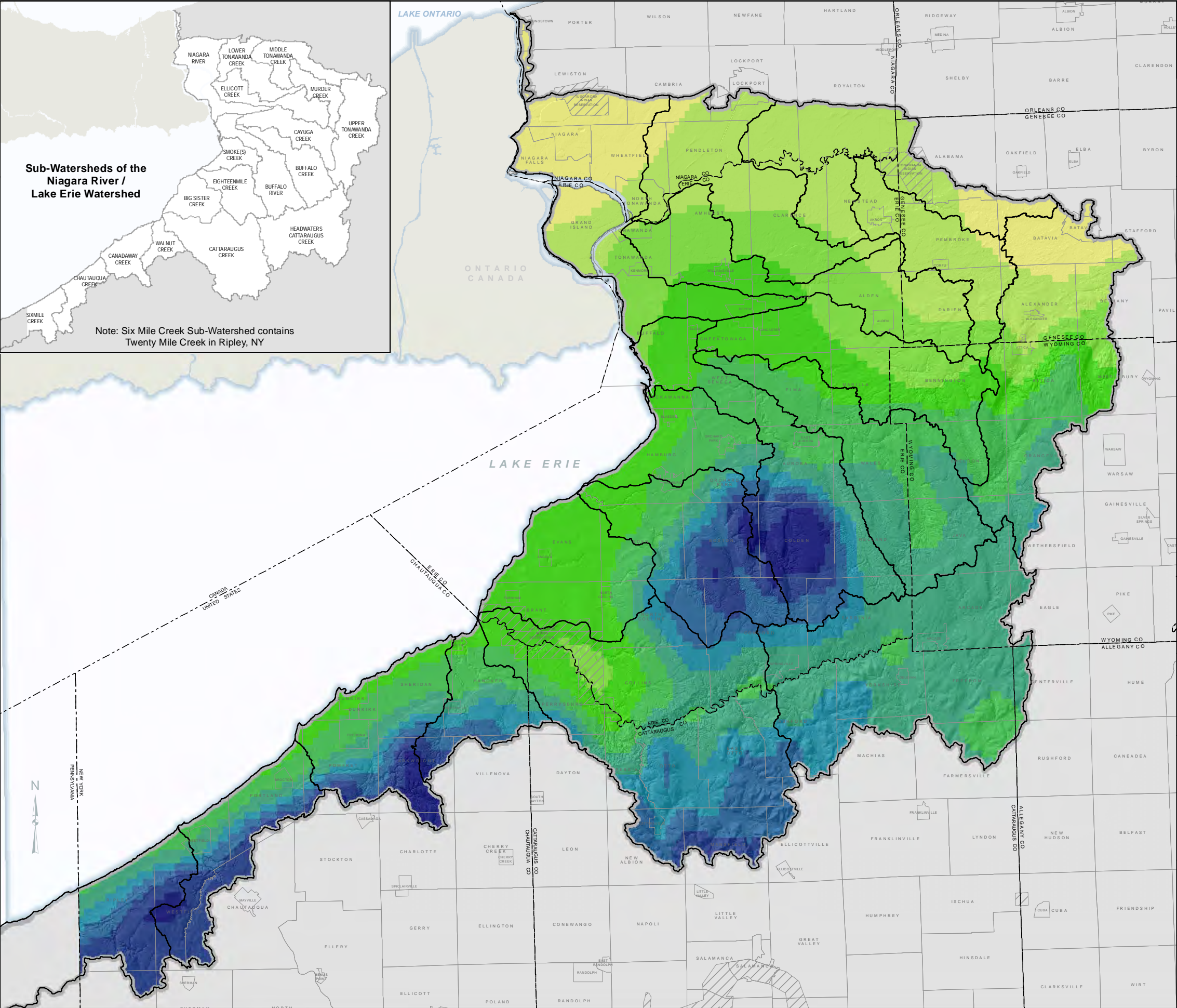
5 2.5 0 5 10
Kilometers

Soils based on SSURGO detailed soil data obtained through USDA NRCS Soil Data Mart.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

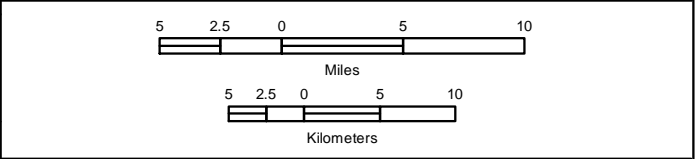
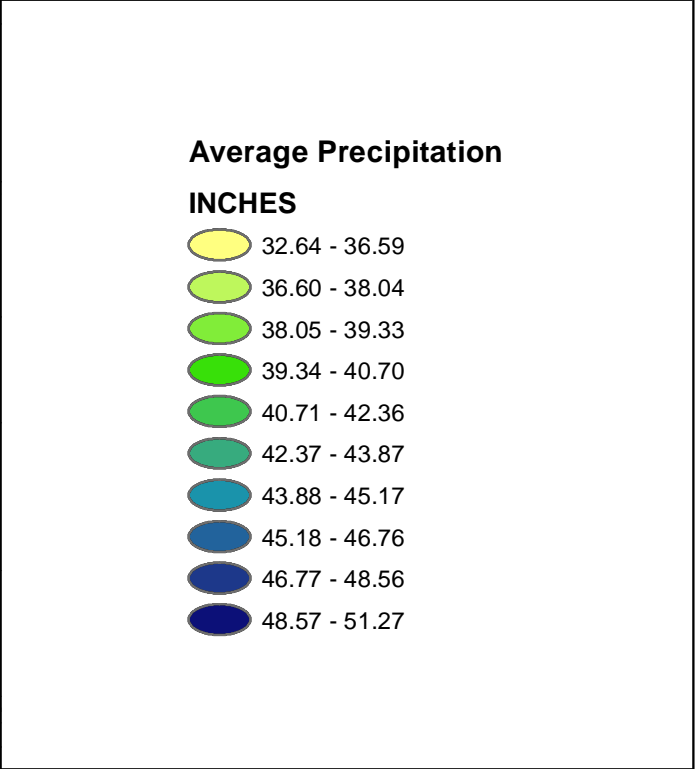
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Regional Niagara River / Lake Erie Watershed Management Plan

AVERAGE ANNUAL PRECIPITATION (1971 - 2000)



30-year climatological average precipitation data obtained from the PRISM Climate Group at Oregon State University (1981-2010). <http://prism.oregonstate.edu> published 2012

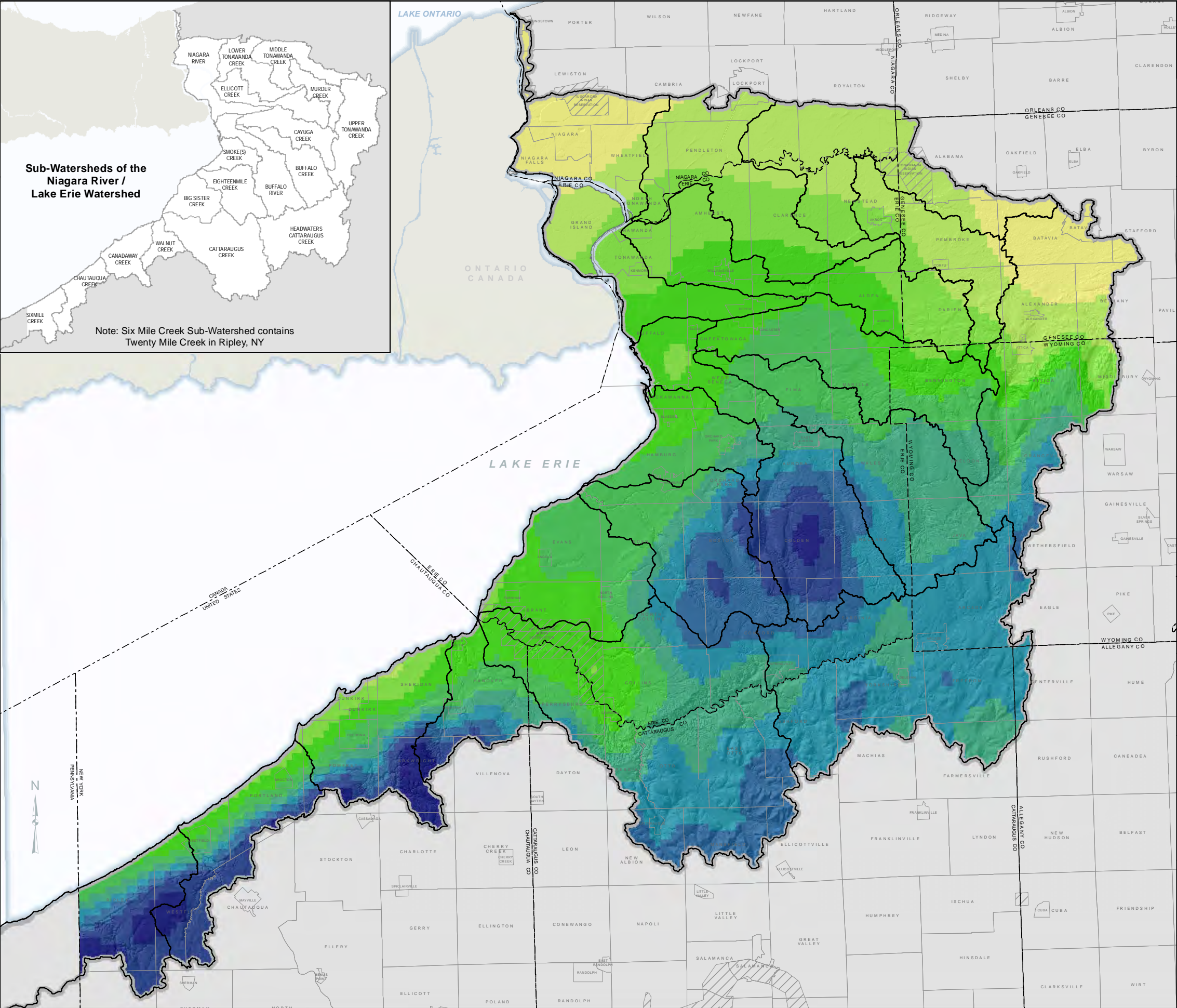
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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NEW YORK STATE OF OPPORTUNITY Department of State

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Regional Niagara River / Lake Erie Watershed Management Plan

AVERAGE ANNUAL PRECIPITATION (1981 - 2010)

Average Precipitation INCHES

33.28 - 36.59
36.60 - 38.04
38.05 - 39.33
39.34 - 40.70
40.71 - 42.36
42.37 - 43.87
43.88 - 45.17
45.18 - 46.76
46.77 - 48.56
48.57 - 51.66

○ Sub-Watershed Boundary

□ County

○ Project Area

□ Municipality

▨ Indian Reservation

~ Waterways



5 2.5 0 5 10 Miles


5 2.5 0 5 10 Kilometers

30-year climatological average precipitation data obtained from the PRISM Climate Group at Oregon State University (1981-2010). <http://prism.oregonstate.edu> published 2012

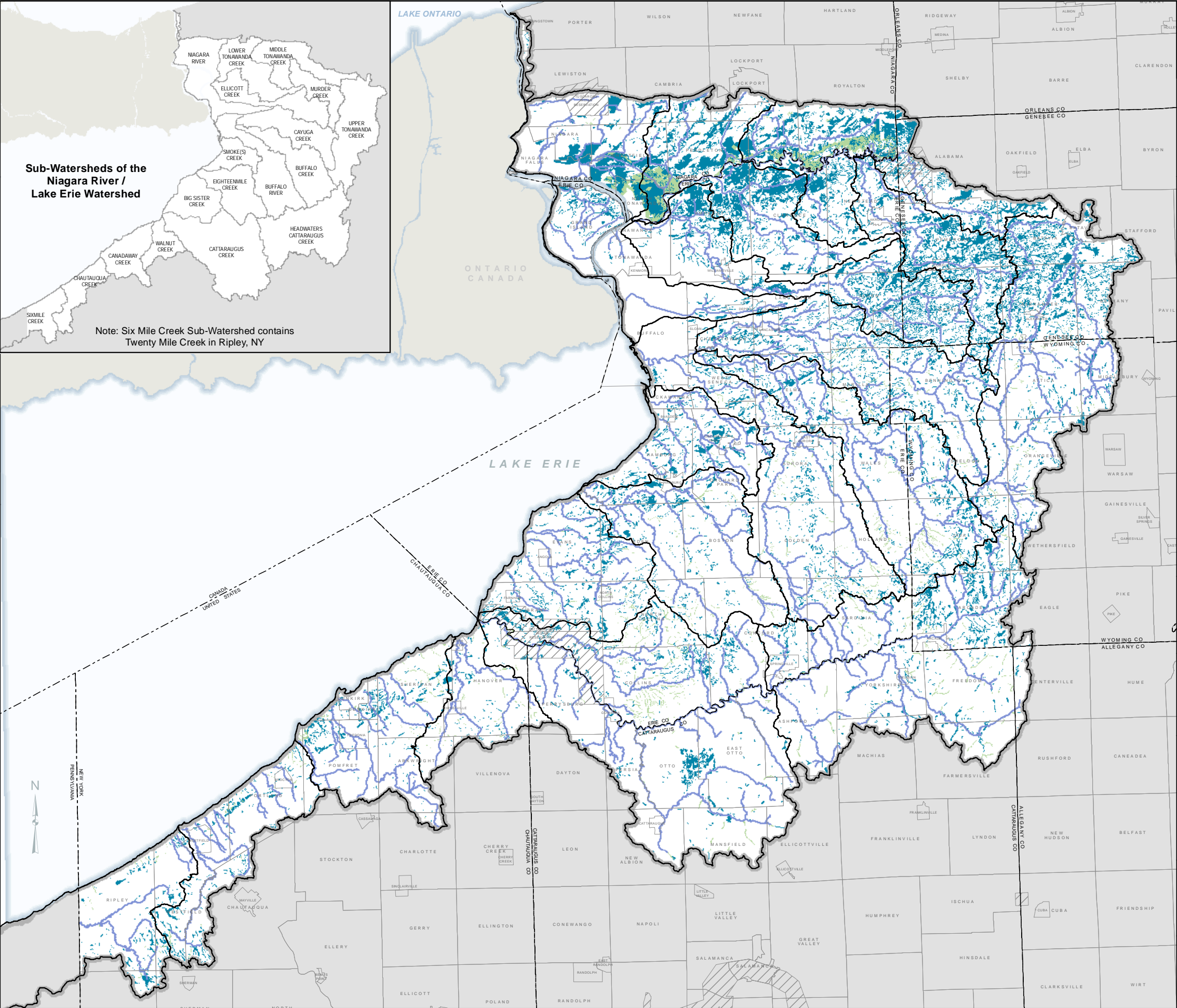
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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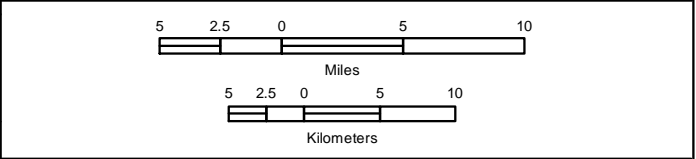
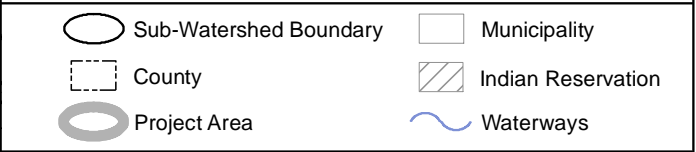
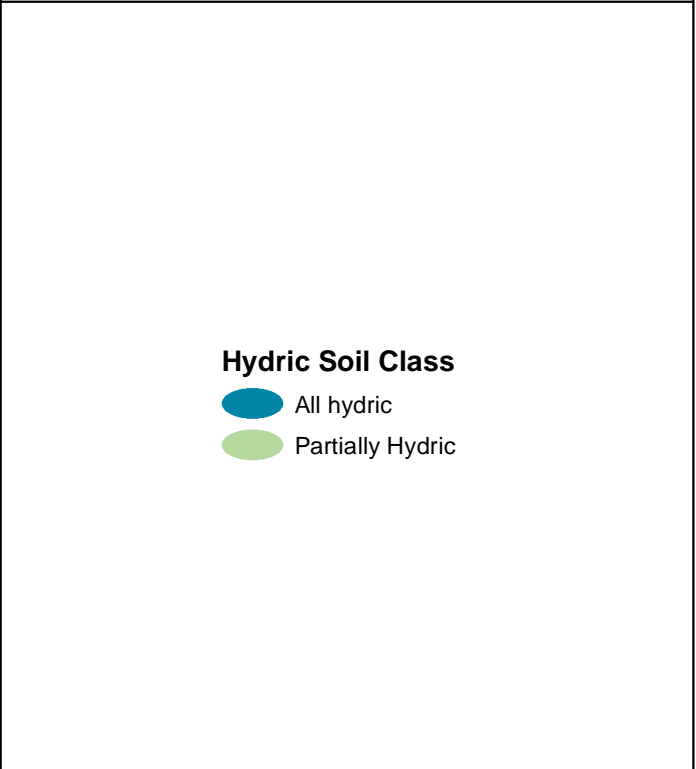


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Regional Niagara River / Lake Erie Watershed Management Plan

HYDRIC SOILS



Soils based on SSURGO detailed soil data obtained through USDA NRCS Soil Data Mart.

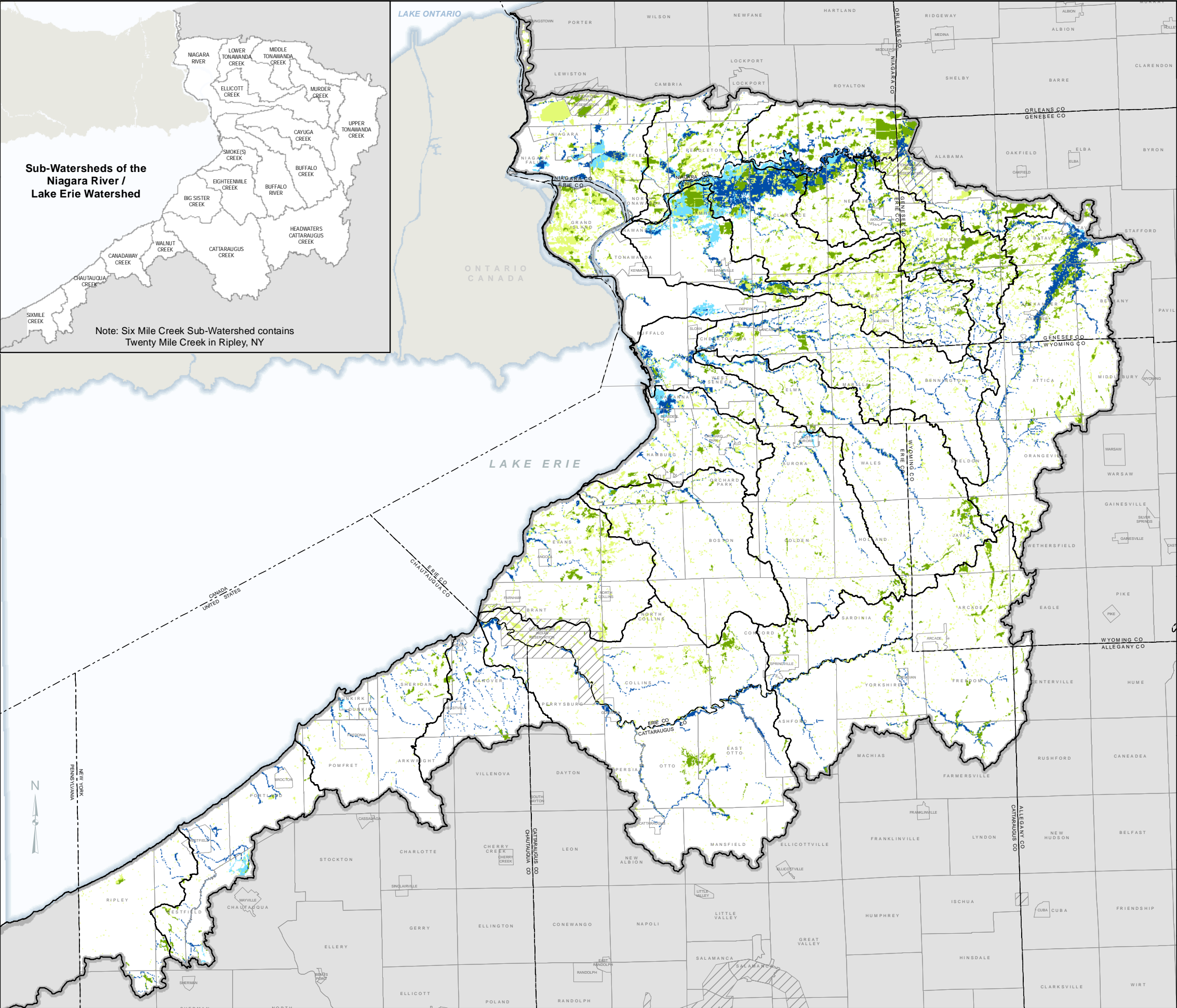
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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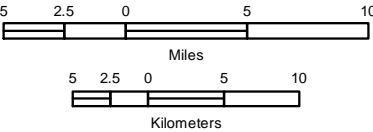


Regional Niagara River / Lake Erie Watershed Management Plan

WETLANDS AND FLOODPLAINS

- State Wetland
- Federal Wetland
- 100-Yr Floodplain
- 500-Yr Floodplain

- Sub-Watershed Boundary
- Municipality
- County
- Indian Reservation
- Project Area
- Waterways



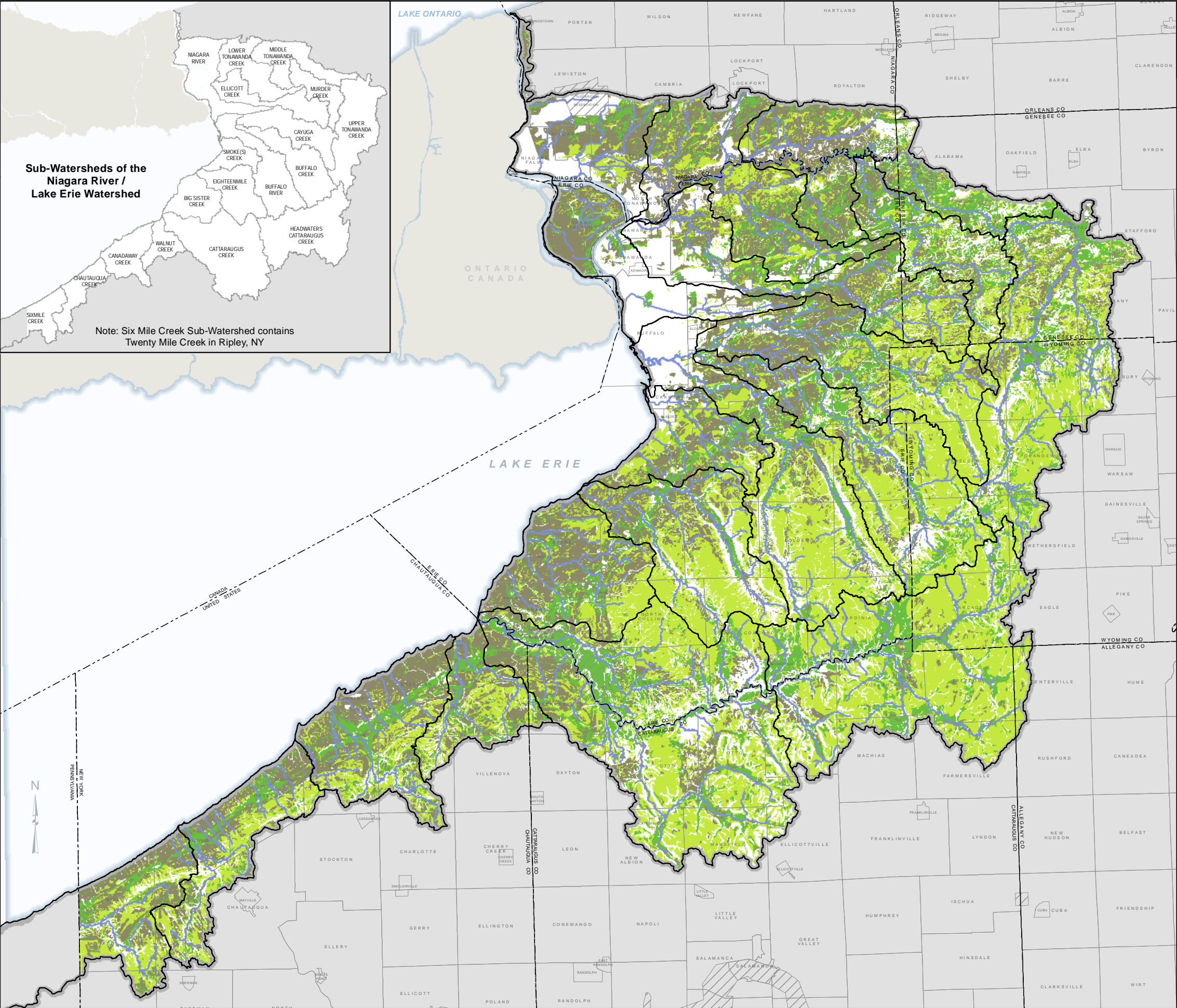
State wetland designations by New York Department of Environmental Conservation, current to April 2010. Federal wetland designations by United States Fish and Wildlife Service National Wetlands Inventory, current to July, 2010. Floodplain data are derived from the Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency. Date varies.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017

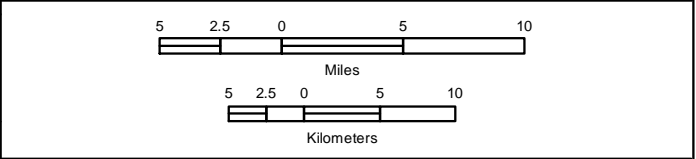
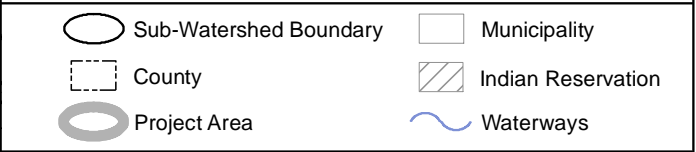
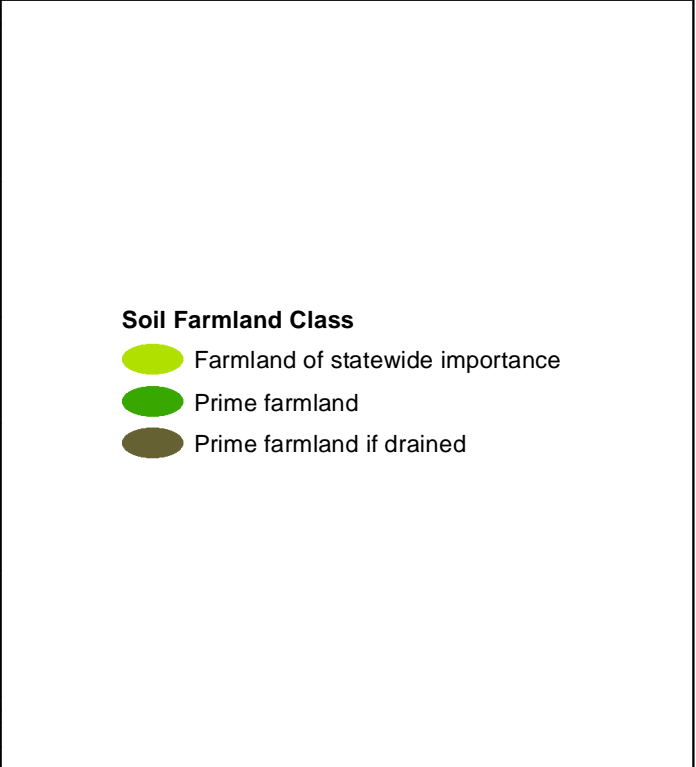


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Regional Niagara River / Lake Erie Watershed Management Plan

PRIME FARMLAND SOILS



Soils based on SSURGO detailed soil data obtained through USDA NRCS Soil Data Mart.

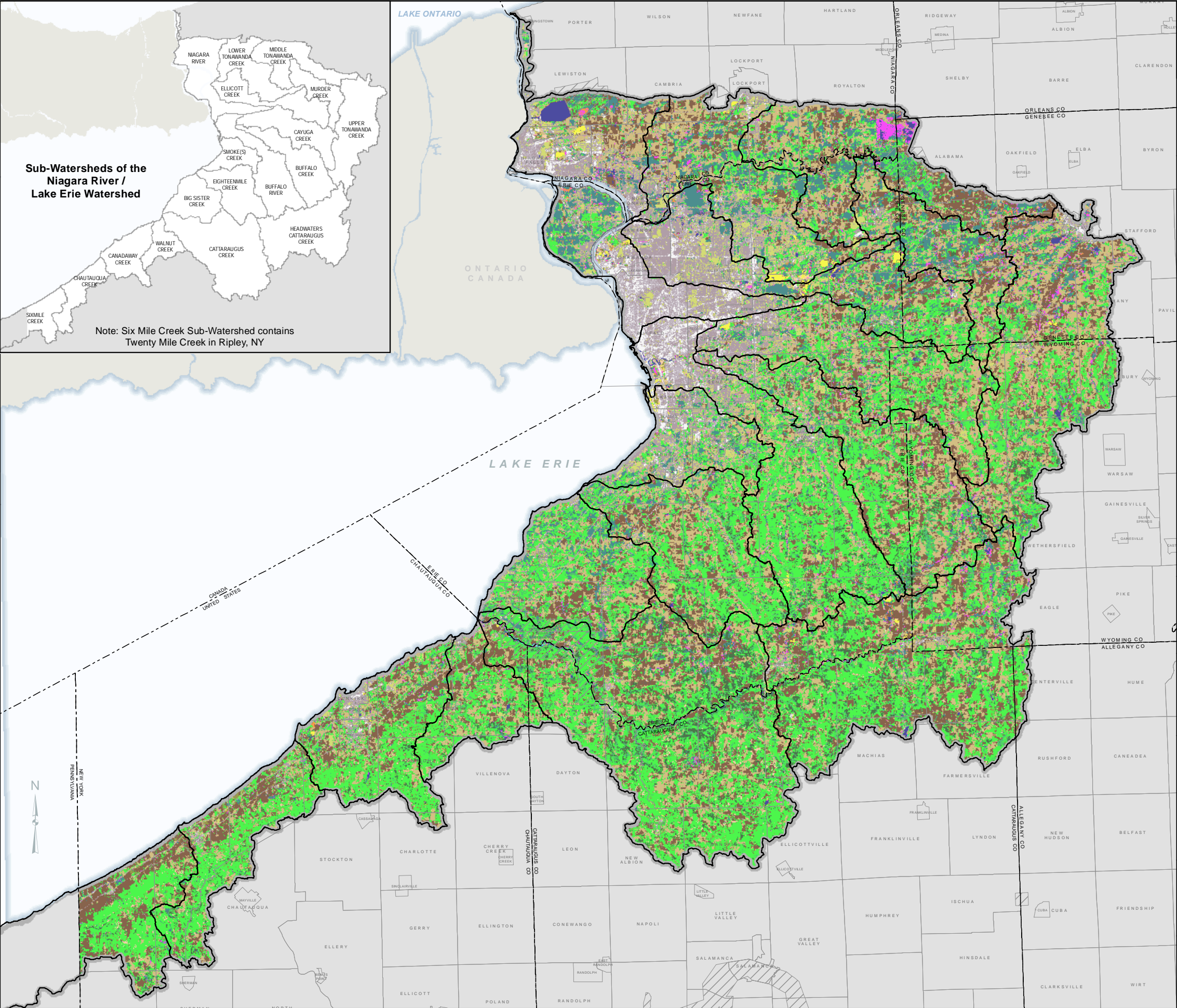
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017



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**Sub-Watersheds of the
Niagara River /
Lake Erie Watershed**

Note: Six Mile Creek Sub-Watershed contains
Twenty Mile Creek in Ripley, NY

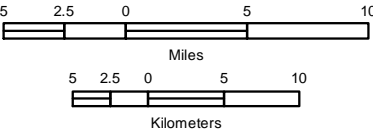
**Regional Niagara River / Lake Erie
Watershed Management Plan**

LAND COVER

Land Use / Land Cover Class

- Developed, High Intensity
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, Open Space
- Cultivated Crops
- Pasture/Hay
- Grassland/Herbaceous
- Scrub/Shrub
- Bare Land
- Evergreen Forest
- Deciduous Forest
- Mixed Forest
- Palustrine Aquatic Bed
- Palustrine Emergent Wetland
- Palustrine Forested Wetland
- Palustrine Scrub/Shrub Wetland
- Estuarine Emergent Wetland
- Open Water
- Unconsolidated Shore

- Sub-Watershed Boundary
- County
- Project Area
- Municipality
- Indian Reservation
- Waterways



Land Use / Land Cover from NOAA Coastal Services Center
30m resolution, 2010

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit
Hydrologic Unit Codes (HUC).







Map created by Erie County Office of GIS: April 2017

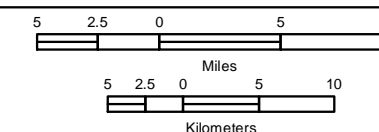


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NATURAL HABITATS AND PUBLIC LANDS

-  Bird Conservation Areas
-  National Wildlife Refuge
-  State Forest
-  State Wildlife Management Area
-  State Multiple Use Area
-  State Unique Area
-  State Fishing Access Site
-  State Significant Coastal Habitat
-  State Park
-  County Park
-  Municipal Park
-  The Nature Conservancy Lands
-  Natural Heritage Community
-  Important Bird Areas (Generalized)
-  Rare Plants and/or Animals (Generalized)

-  Sub-Watershed Boundary
  Municipality
-  County
  Indian Reservation
-  Project Area
  Waterways



State Significant Coastal Habitat Areas are designated by New York Department of State Division of Coastal Resources.

New York Nature Explorer provides distribution and status information on New York's animals, plants, and significant natural communities. The information is housed in databases maintained by NYS Dept of Environmental Conservation and the NY Natural Heritage Program.

Important Bird Areas (IBAs) are identified by Audubon New York. The identification of IBAs is about determining the most important places for bird species vulnerable to habitat loss or disturbances. Examples include species that are rare or threatened, congregate in large numbers in one place at one time, or are restricted in distribution or to a particular habitat or region.

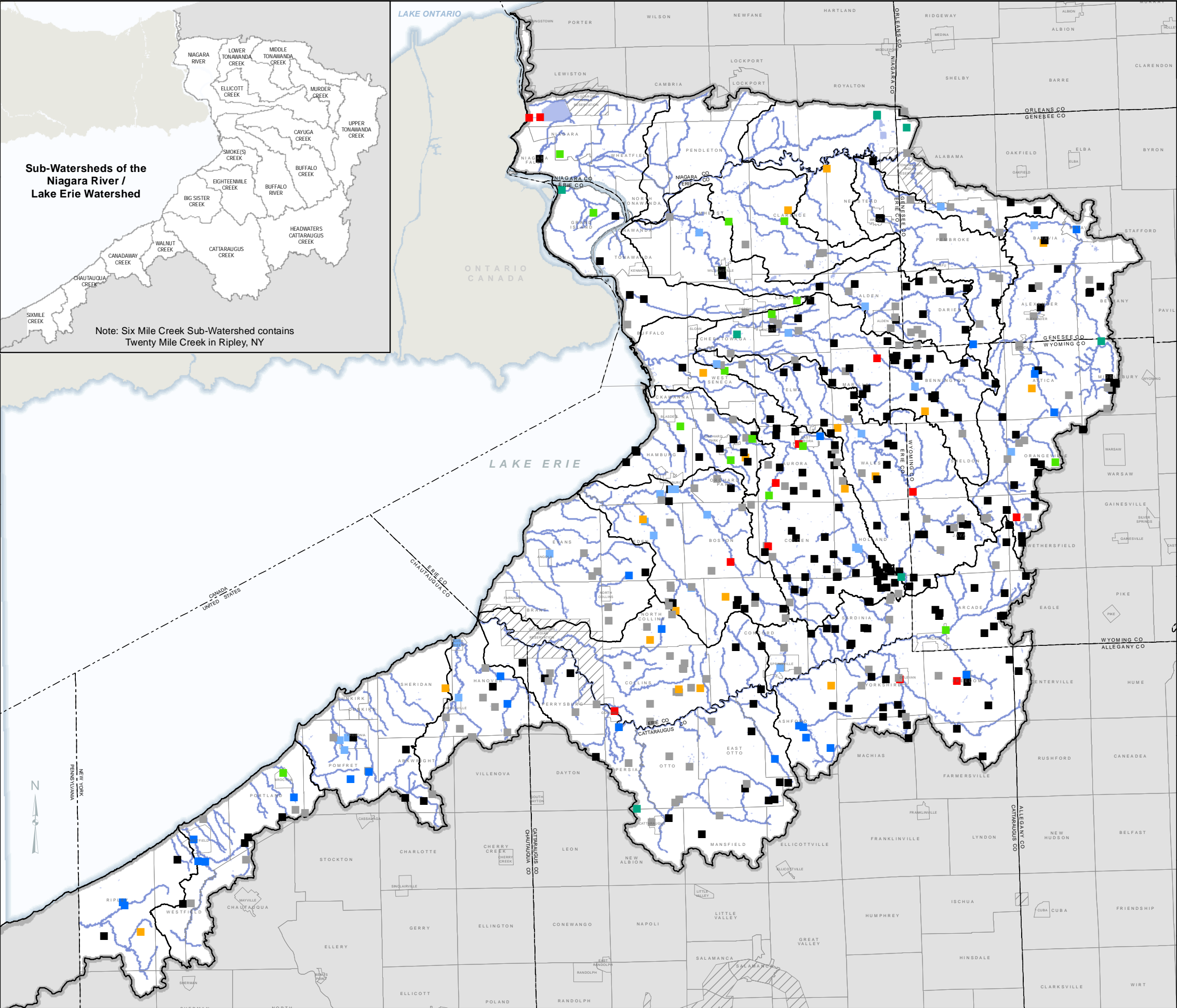
Public Lands are under the care, custody and control of the UR Fish and Wildlife Service; NYS Department of Conservation; NYS Parks, Recreation, and Historic Preservation; or an individual County or Municipality.

The Nature Conservancy Lands are a spatial dataset of public and private lands secured by a conservation situation that includes an explicit level of security from future conversion.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).
Map created by Erie County Office of GIS: April 2017



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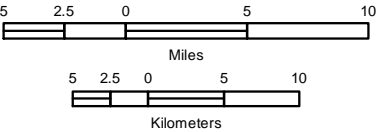


Regional Niagara River / Lake Erie Watershed Management Plan

STATE INVENTORY OF DAMS

- Purpose of Dam**
- Fire Protection
 - Fish and Wildlife Pond
 - Flood Control and Storm Water
 - Hydroelectric
 - Irrigation
 - Water Supply
 - Recreation
 - Other

- Sub-Watershed Boundary
- County
- Project Area
- Municipality
- Indian Reservation
- Waterways



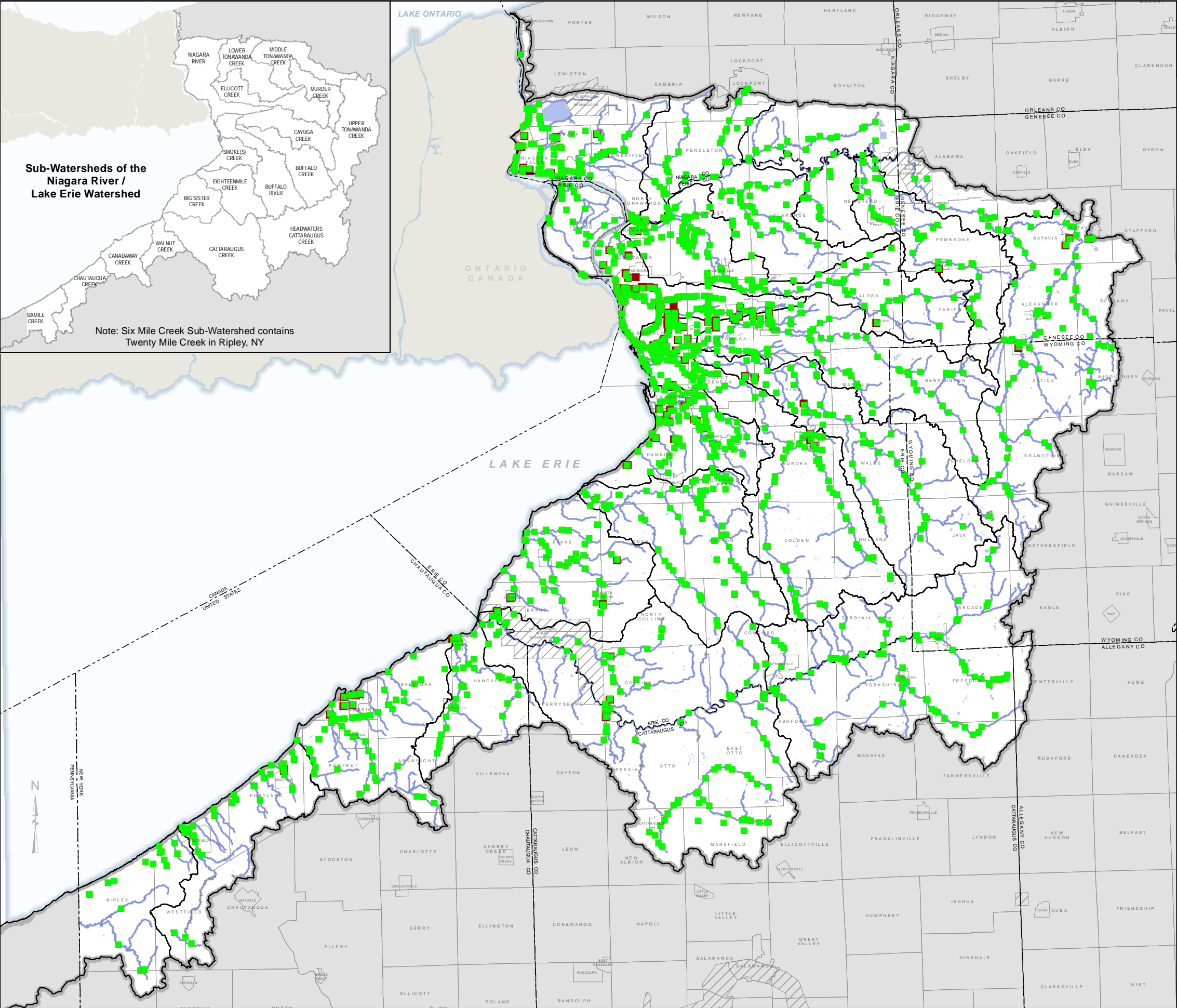
This dataset is used to show the location of dams in New York State's Inventory of dams, and lists selected attributes of each dam, NYS DEC, November 2009

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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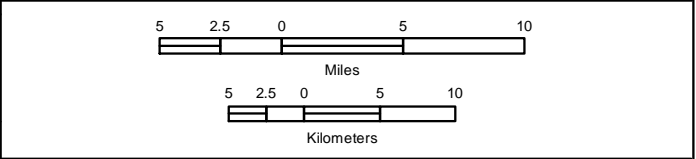


Regional Niagara River / Lake Erie Watershed Management Plan

HIGHWAY AND RAILWAY BRIDGES

- Highway Bridge
- Railway Bridge

○ Sub-Watershed Boundary	□ Municipality
□ County	▨ Indian Reservation
○ Project Area	~ Waterways



National Bridge Inventory (NBI) database provided by the Federal Highway Administration, Office of Bridge Technology 2007, NYS Department of Transportation 2014, and Federal Emergency Management Agency 2012

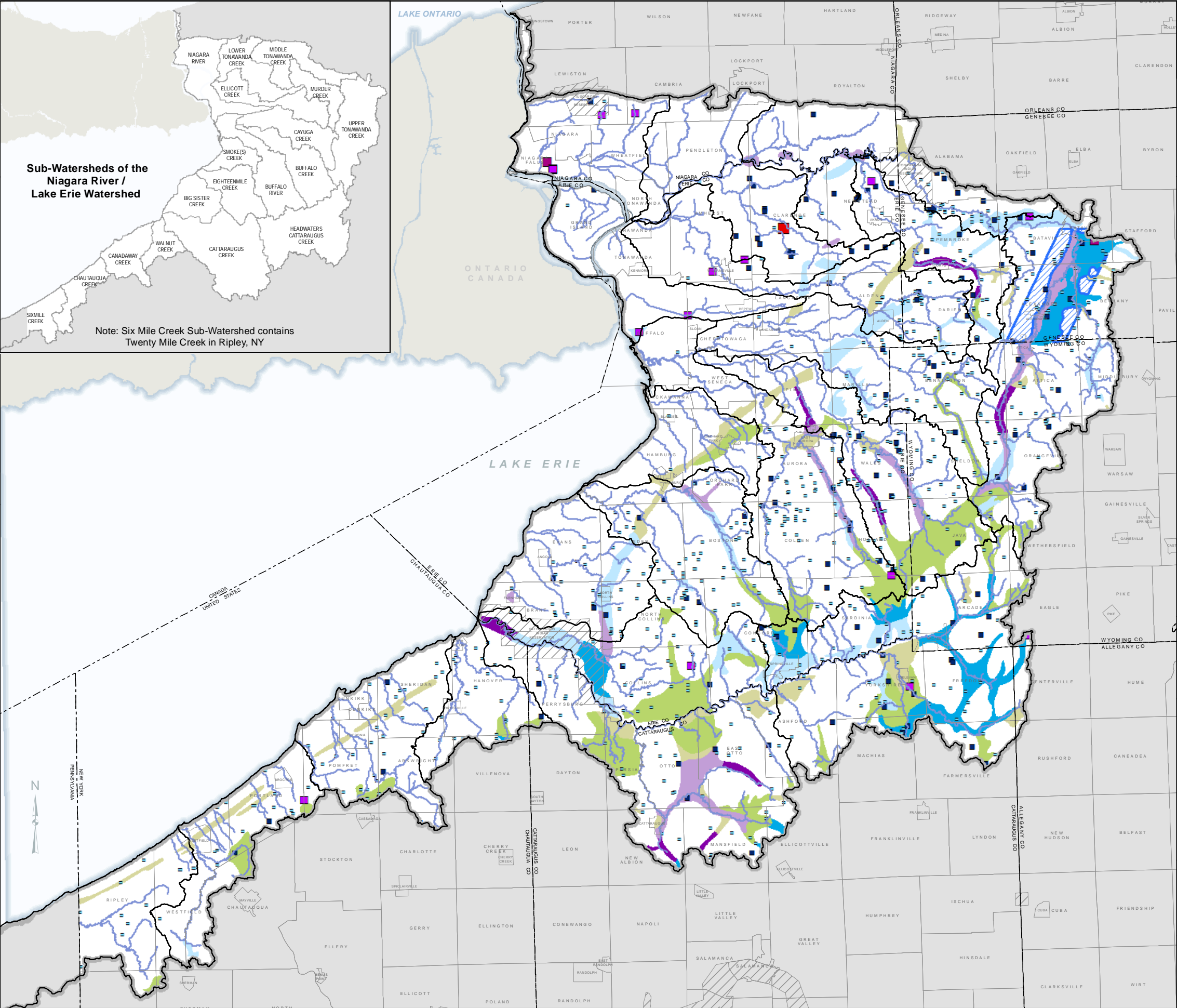
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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NEW YORK STATE OF OPPORTUNITY
Department of State

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Regional Niagara River / Lake Erie Watershed Management Plan

WATER WELLS AND UNCONSOLIDATED AQUIFERS

Water Well Discharge Rate (Gallons per Minute)

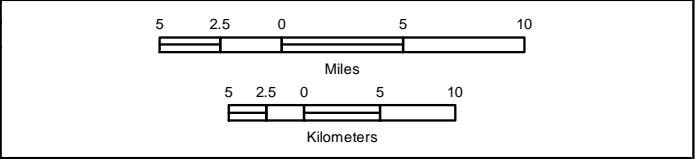
- 0-19
- 20-75
- 100-300
- 600-1000
- 10000
- N/A

Unconsolidated Aquifers

- Primary Aquifer Region
- Unconfined, High Yield
- Unconfined, Mid Yield
- Confined, No Overlying Surficial Aquifer
- Confined, Unknown Depth and Thickness
- Kame, Outwash or Alluvium
- Moraine

Legend for map features:

- Sub-Watershed Boundary
- County
- Project Area
- Municipality
- Indian Reservation
- Waterways



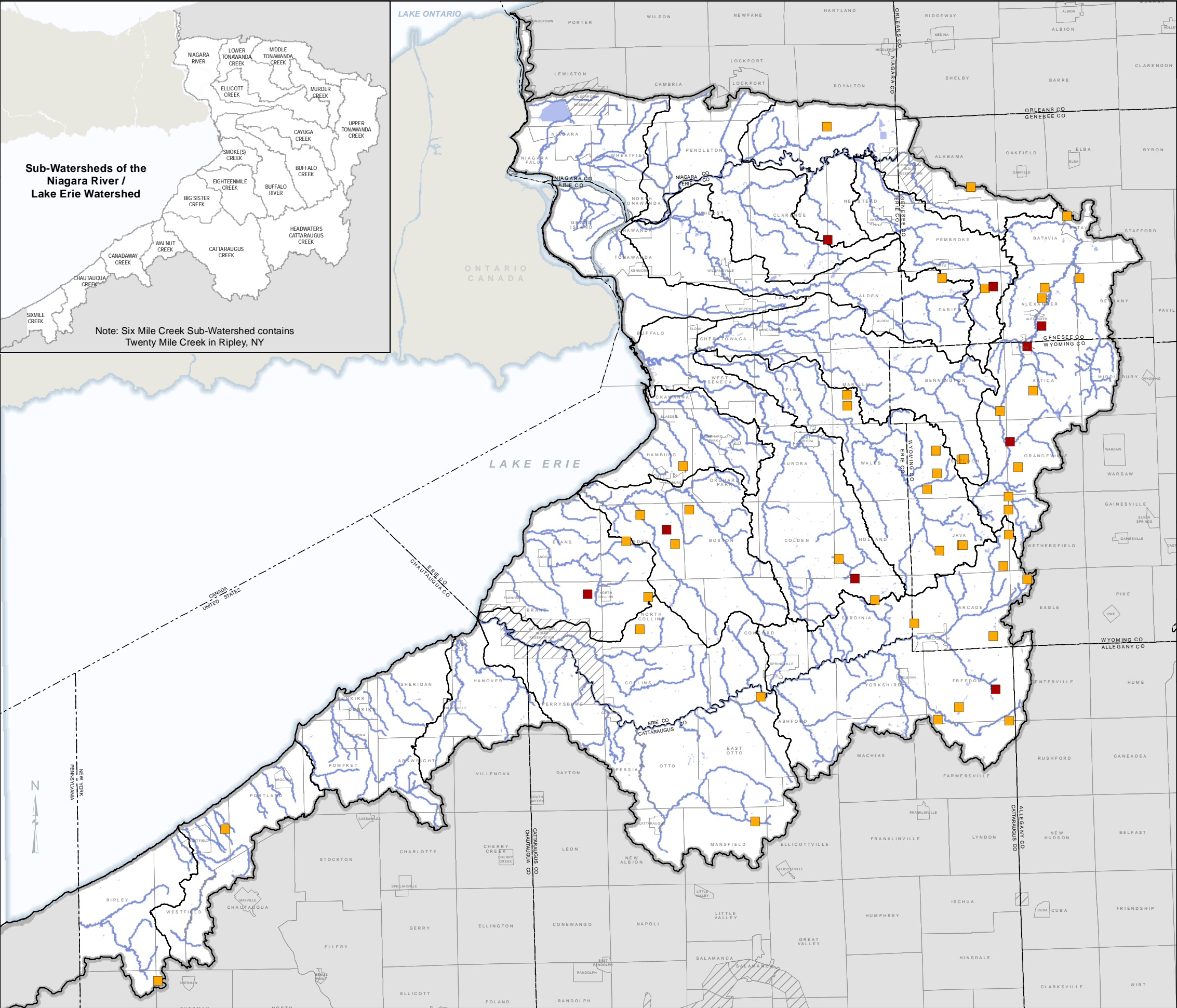
Water well data is developed from well completion reports submitted to NYS DEC and is not always verified. The aquifers represent an effort by NYS DEC to facilitate the identification of the location and extent of significant unconsolidated aquifers; those that consist of sand and gravel and yield large supplies of water to wells. Unconfined aquifers are those into which water seeps from the ground surface directly above the aquifer. Confined aquifers are those in which an impermeable dirt/rock layer exists that prevents water from seeping into the aquifer from the ground surface located directly above.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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Regional Niagara River / Lake Erie Watershed Management Plan

STATE PERMITS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOS)

Large CAFO

Medium CAFO

Sub-Watershed Boundary

County

Project Area

Municipality

Indian Reservation

Waterways

5 2.5 0 5 10

Miles

5 2.5 0 5 10

Kilometers

The New York State Departments of Environmental Conservation and Agriculture and Markets, the State Soil and Water Conservation Committee, farmers, agribusiness, and other interested parties develop CAFO Permits. These five-year term permits meet the business needs of farmers and assist CAFO owners or operators in complying with State and Federal water quality requirements.

A Concentrated Animal Feeding Operation (CAFO) is defined as an operation that confines animals for more than 45 days during a growing season, is in an area that does not produce vegetation, and meets certain size thresholds. There are three categories of CAFOs (small, medium, large) and the relevant animal unit for each category varies depending on species and capacity.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

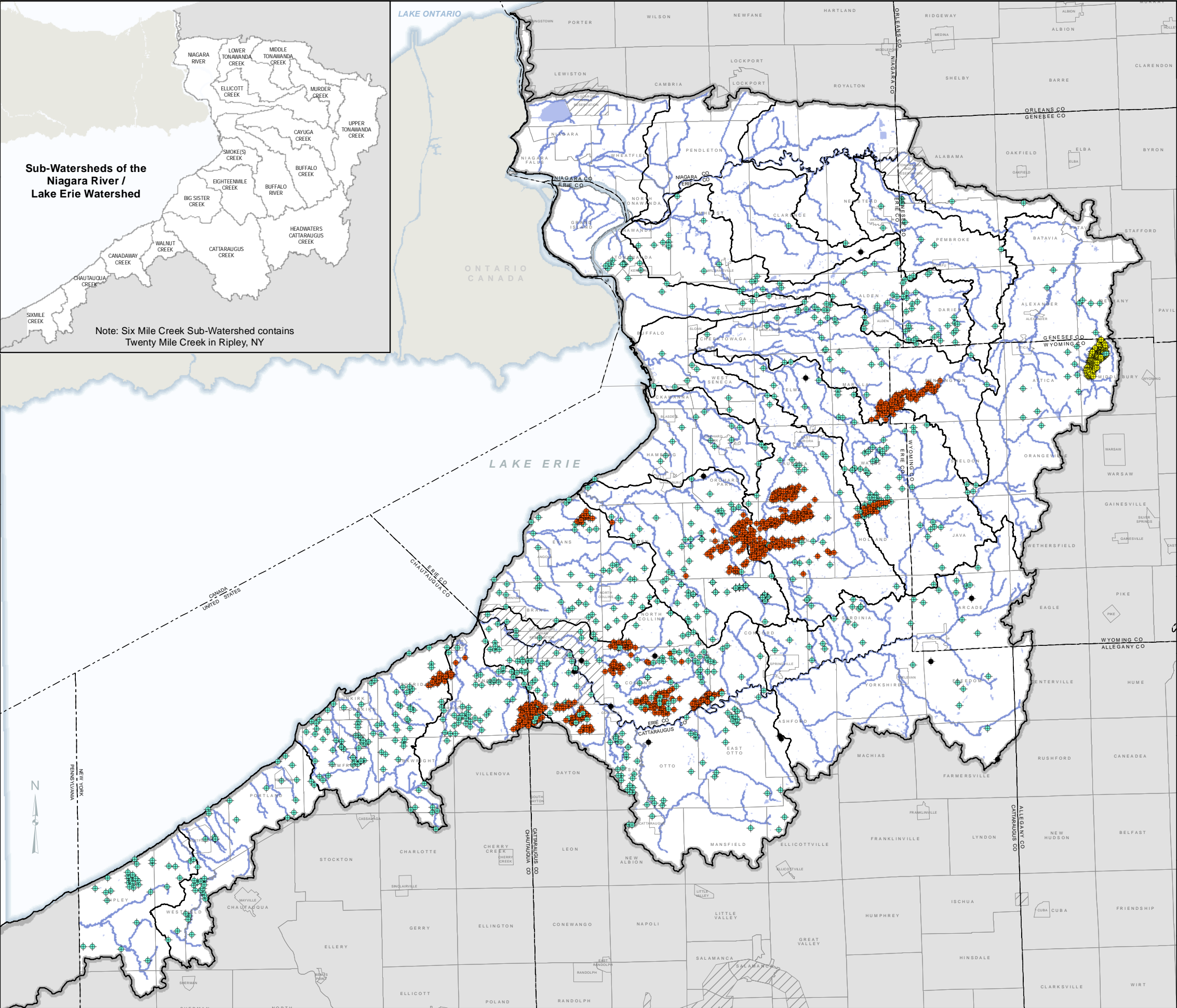
Map created by Erie County Office of GIS: April 2017

Maps

NEW YORK STATE OF OPPORTUNITY

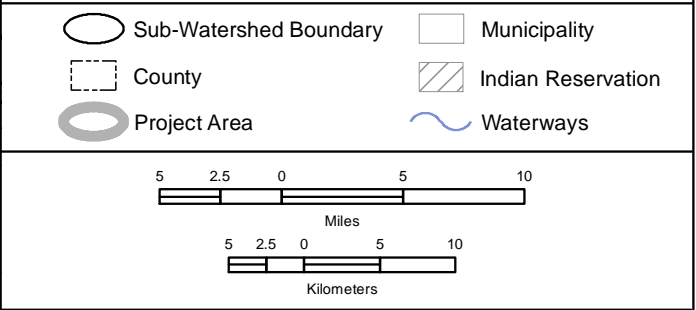
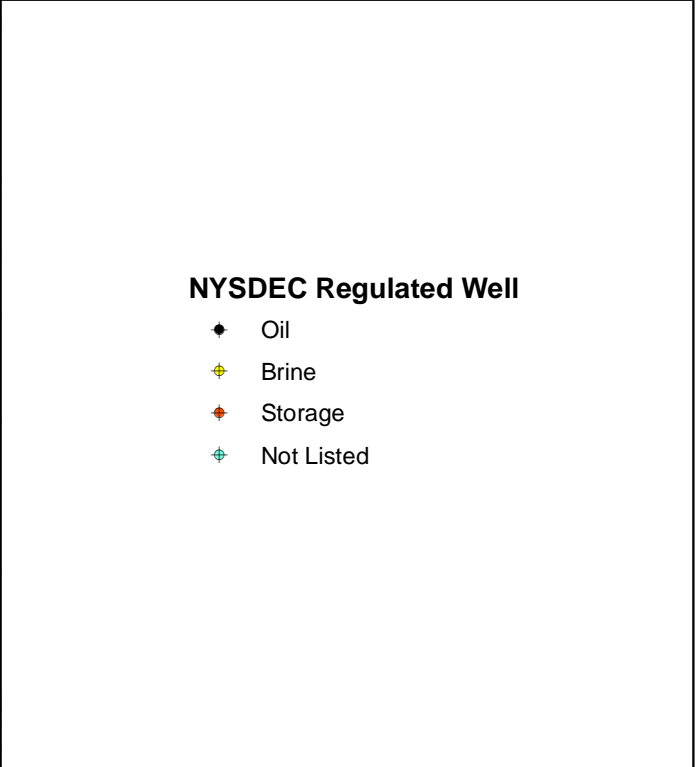
Department of State

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Regional Niagara River / Lake Erie Watershed Management Plan

STATE REGULATED OIL, BRINE, AND STORAGE WELLS



Well dataset contains locations of oil, gas, and other service wells. The Division of Mineral Resources maintains information and data on almost 40,000 wells, categorized under New York State Article 23 Regulated Wells

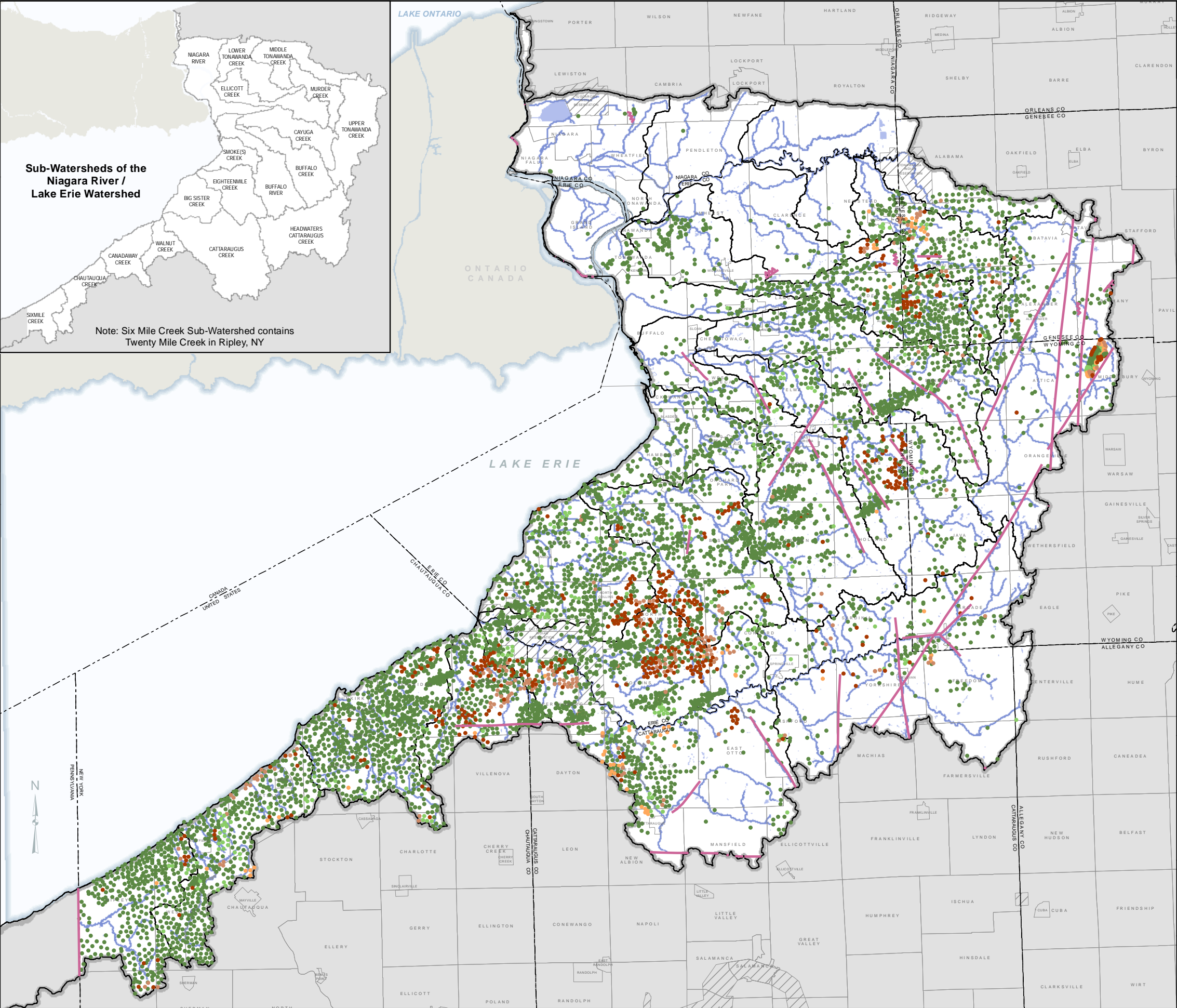
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017



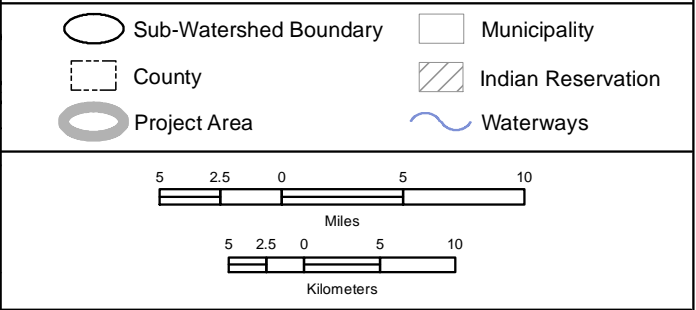
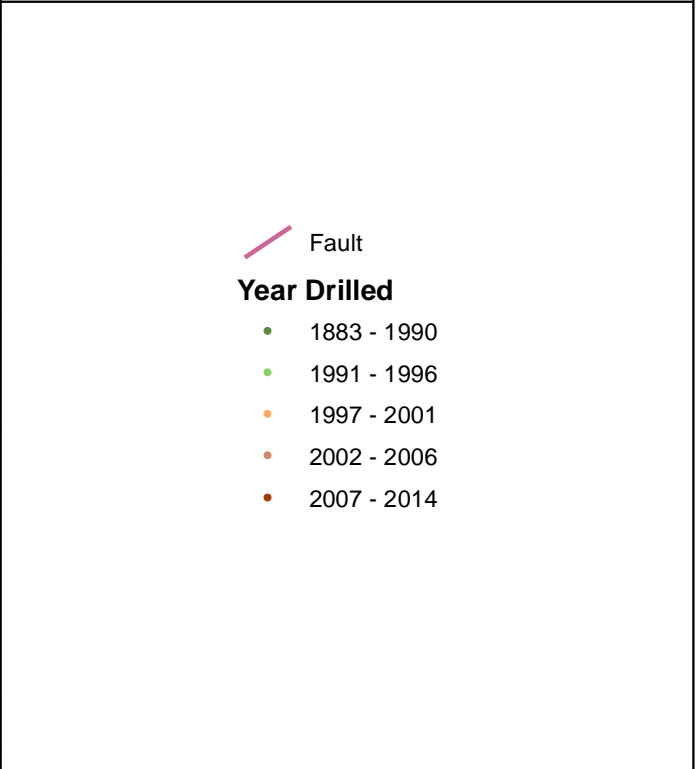
NEW YORK STATE OF OPPORTUNITY
Department of State

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STATE REGULATED WELLS AND FAULT LINES



Well dataset contains locations of oil, gas, and other service wells. The Division of Mineral Resources maintains information and data on almost 40,000 wells, categorized under New York State Article 23 Regulated Wells. Fault data is provided by the New York State Museum from the 1977 Preliminary Brittle Structures Map of New York State published by the NYS Education Department.

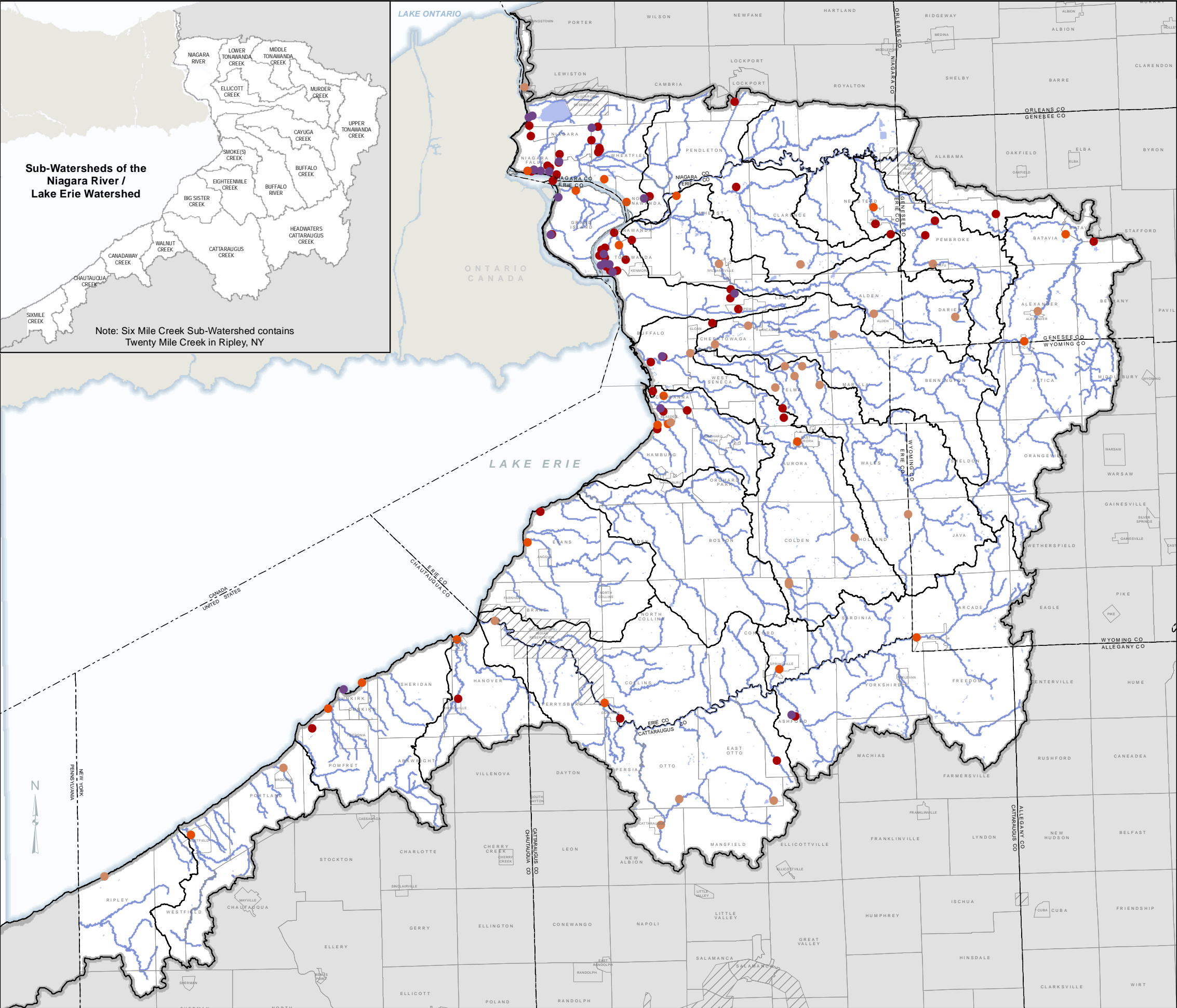
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017



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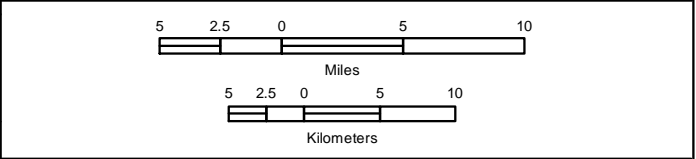
Regional Niagara River / Lake Erie Watershed Management Plan

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES)

SPDES Discharge

- 01 - State Significant Industrial
- 03 - EPA Major Industrial
- 05 - EPA Major Municipal
- 07 - State Significant Municipal

○ Sub-Watershed Boundary □ Municipality
□ County ▨ Indian Reservation
○ Project Area ~ Waterways



State Pollution Discharge Elimination System locations from NYS Department of Environmental Conservation Division of Water, 2011

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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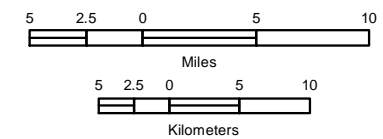
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Remediation Site Class

- 02 - Significant Threat; Action Required
- 03 - No Significant Threat; Action May Be Deferred
- 04 - Site Properly Closed; Requires Management
- A - Active, Remedial Work is Underway
- C - Remediation Complete

	Sub-Watershed Boundary		Municipality
	County		Indian Reservation
	Project Area		Waterways



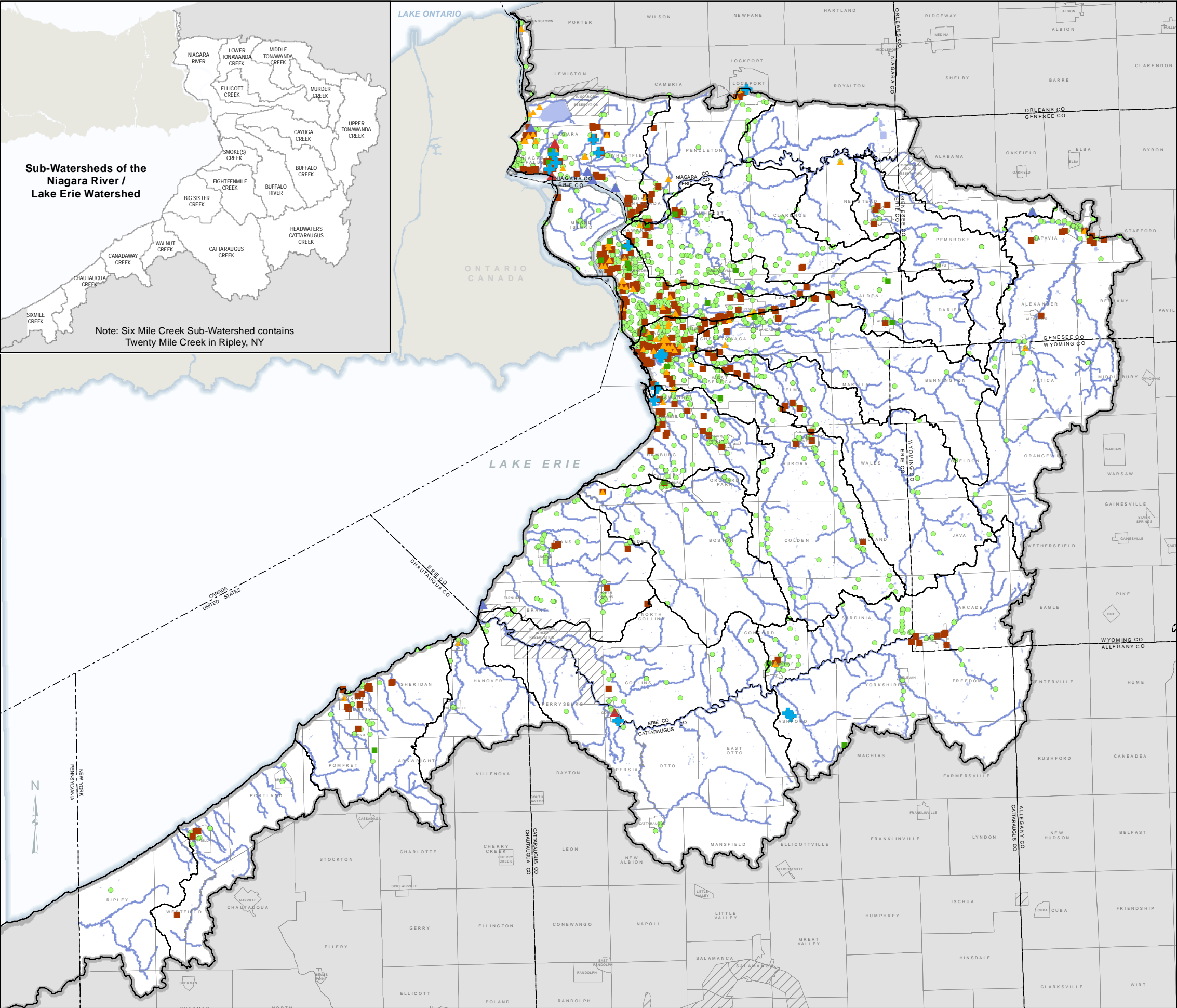
Points representing the locations for each remediation site in New York State. The file formerly known as Inactive Hazardous Waste Sites is now included in the Remediation Sites file. July 2010

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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Regional Niagara River / Lake Erie Watershed Management Plan


ENVIRONMENTAL PROTECTION AGENCY REGULATED FACILITIES (1 OF 2)

The Environmental Protection Agency (EPA) is responsible for environmental oversight over a variety of industrial activities under many federal statutes including the Clean Air Act (CAA), Permit Compliance System (PCS), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and Emergency Planning and Community Right-to-Know Act (EPCRA). The EPA also collects information about facilities, site, or places subject to environmental regulation through the Facility Registry System including the Superfund National Priorities List (NPL) and the Toxic Release Inventory System (TRI).

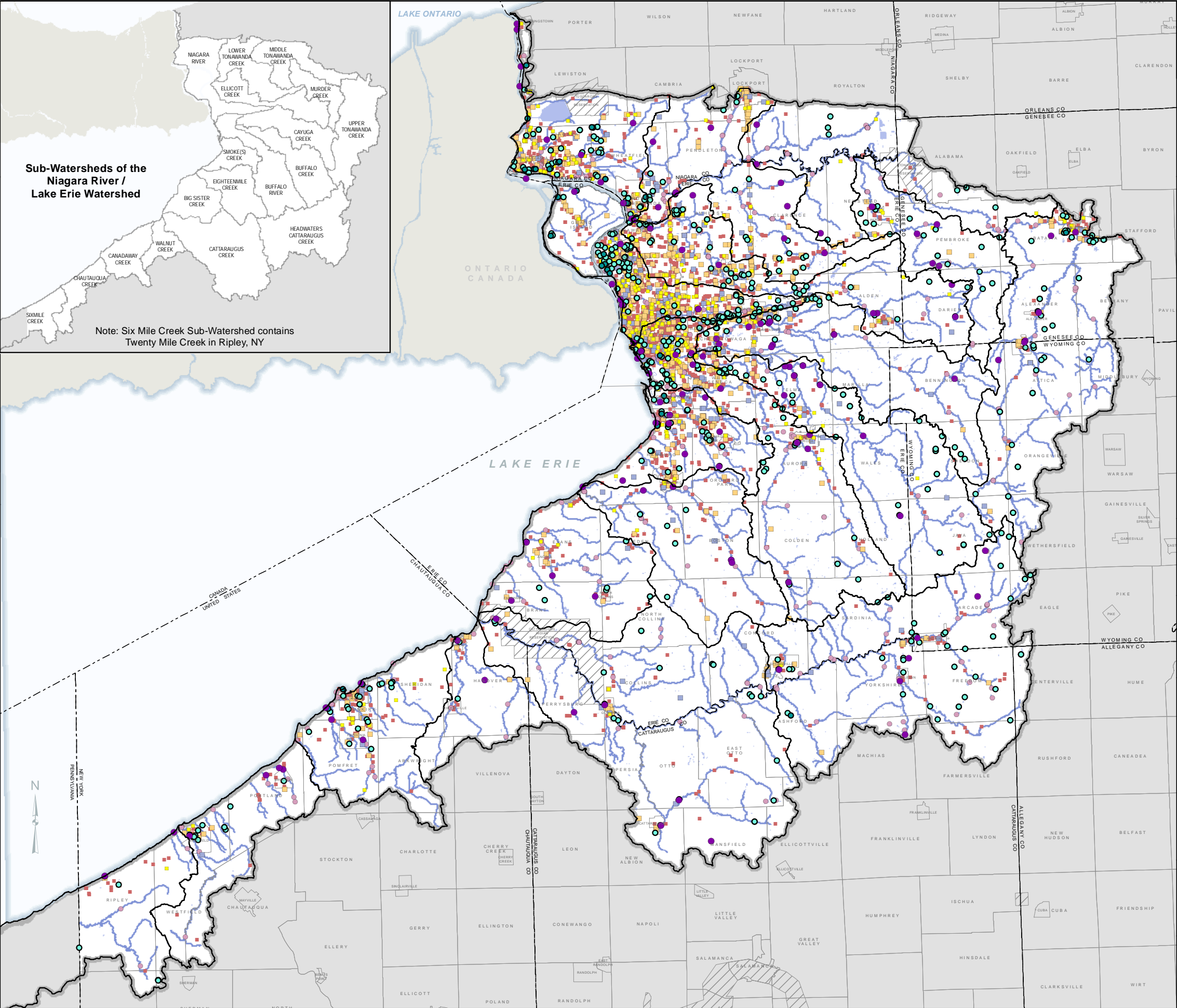
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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Regional Niagara River / Lake Erie Watershed Management Plan


ENVIRONMENTAL PROTECTION AGENCY REGULATED FACILITIES (2 OF 2)

The Environmental Protection Agency (EPA) is responsible for environmental oversight over a variety of industrial activities under many federal statutes including the Clean Air Act (CAA), Permit Compliance System (PCS), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and Emergency Planning and Community Right-to-Know Act (EPCRA). The EPA also collects information about facilities, sites, or places subject to environmental regulation through the Facilities Registry System including the National Pollutant Discharge Elimination System (NPDES) as well as maintaining a STORET Data Warehouse that houses water monitoring locations and activities by data providers.

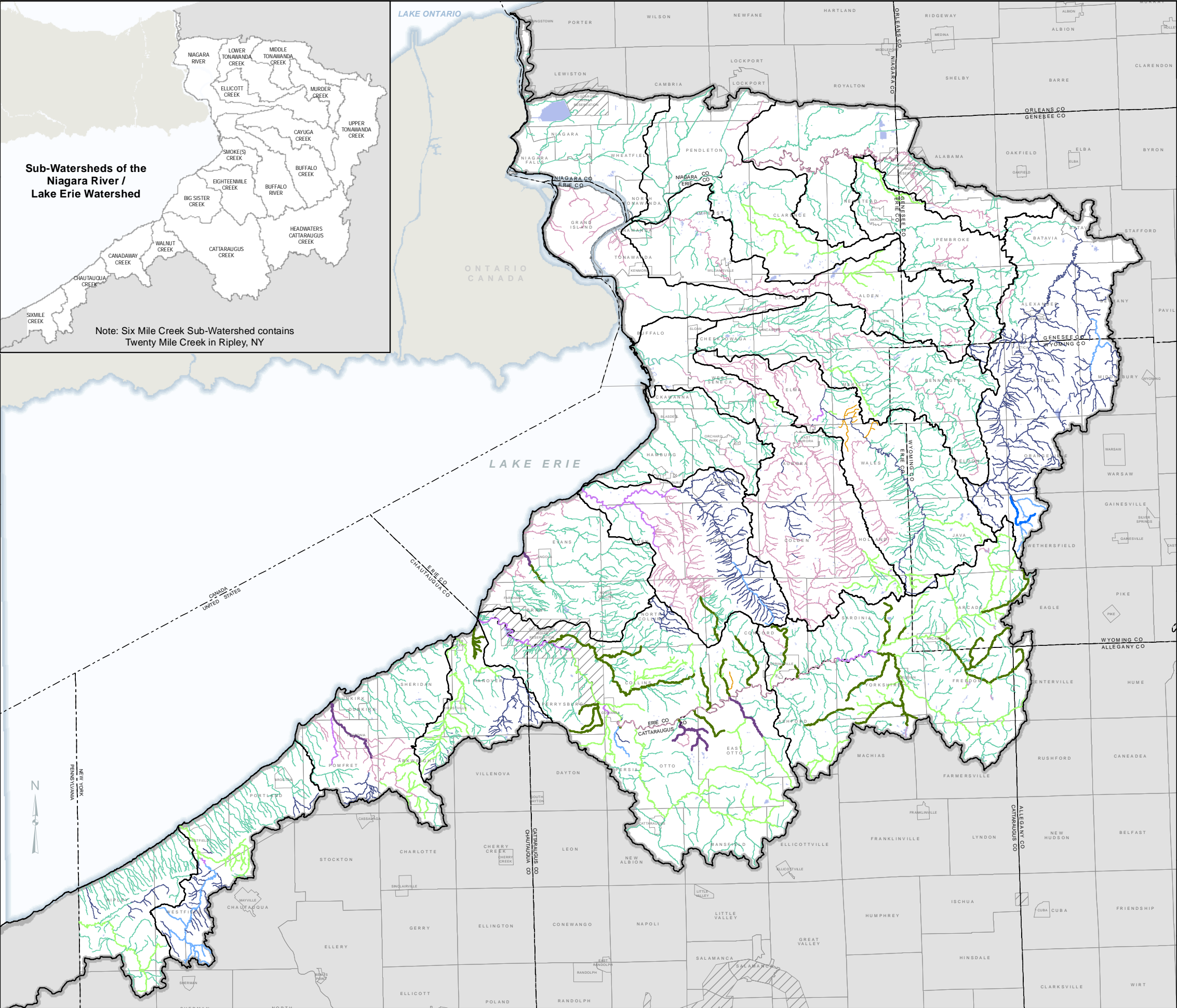
Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017





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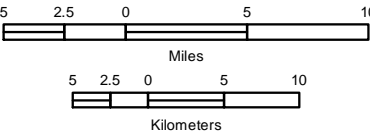
Regional Niagara River / Lake Erie Watershed Management Plan

STATE WATER QUALITY CLASSIFICATIONS

Stream Class

- A or AA
- A(T)
- A(TS)
- B
- B(T)
- B(TS)
- C
- C(T)
- C(TS)
- D

- Sub-Watershed Boundary
- Municipality
- County
- Indian Reservation
- Project Area
- Waterways



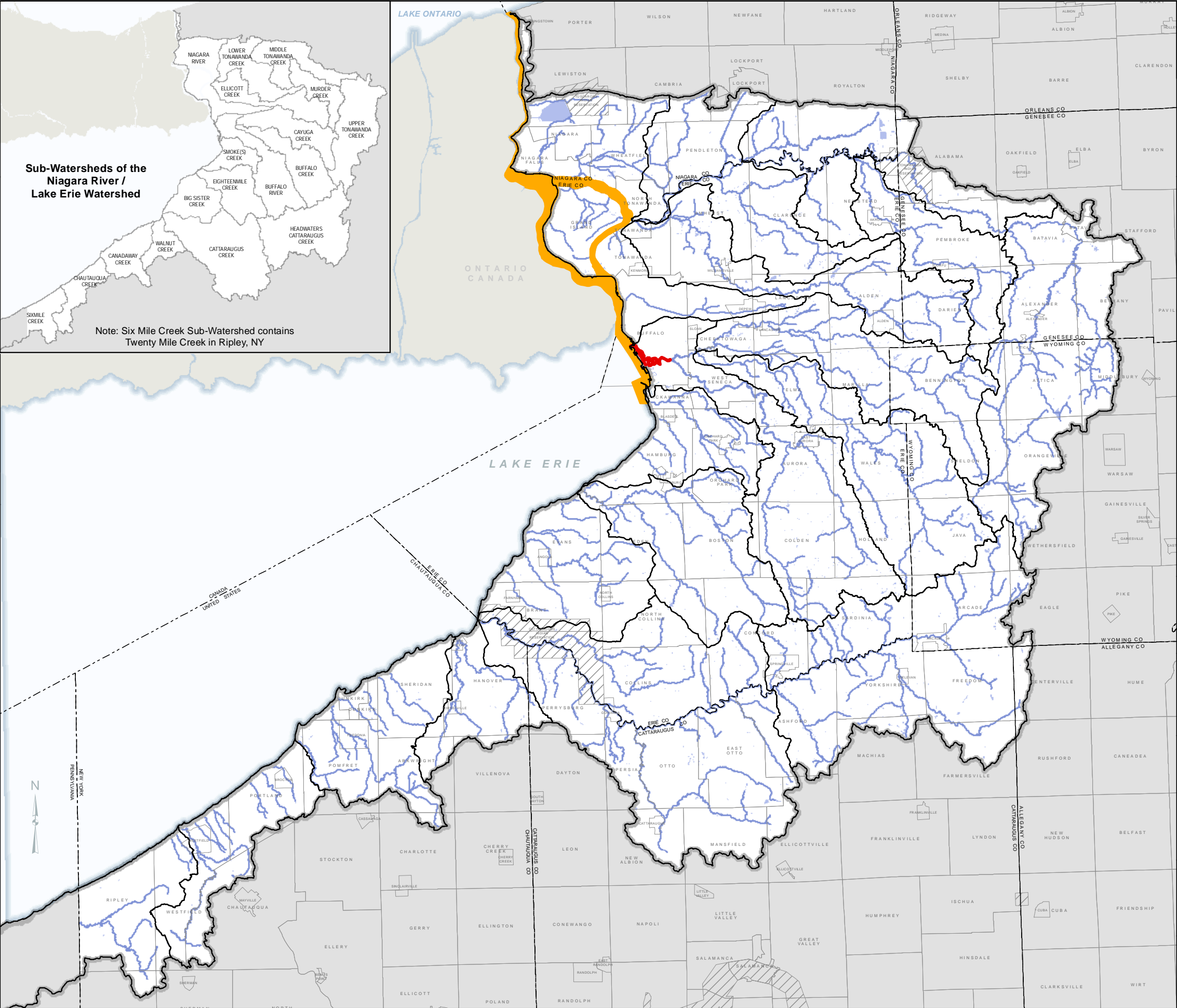
This data set provides the water quality classifications of NYS water bodies. The classification AA or A is assigned to waters used as a source of drinking water. Classification B indicates a best usage for swimming and other contact recreation, but not for drinking water. Classification C is for waters 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. Streams designated as C (T) or higher (i.e., C (TS), B, or A) are collectively referred to as "protected streams." October, 2015

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

Map created by Erie County Office of GIS: April 2017



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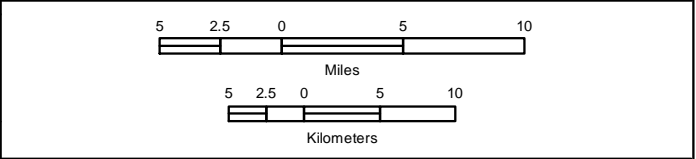


Regional Niagara River / Lake Erie Watershed Management Plan

GREAT LAKES NATIONAL PROGRAM OFFICE AREAS OF CONCERN

- Buffalo River
- Niagara River

- Sub-Watershed Boundary
- County
- Project Area
- Municipality
- Indian Reservation
- Waterways



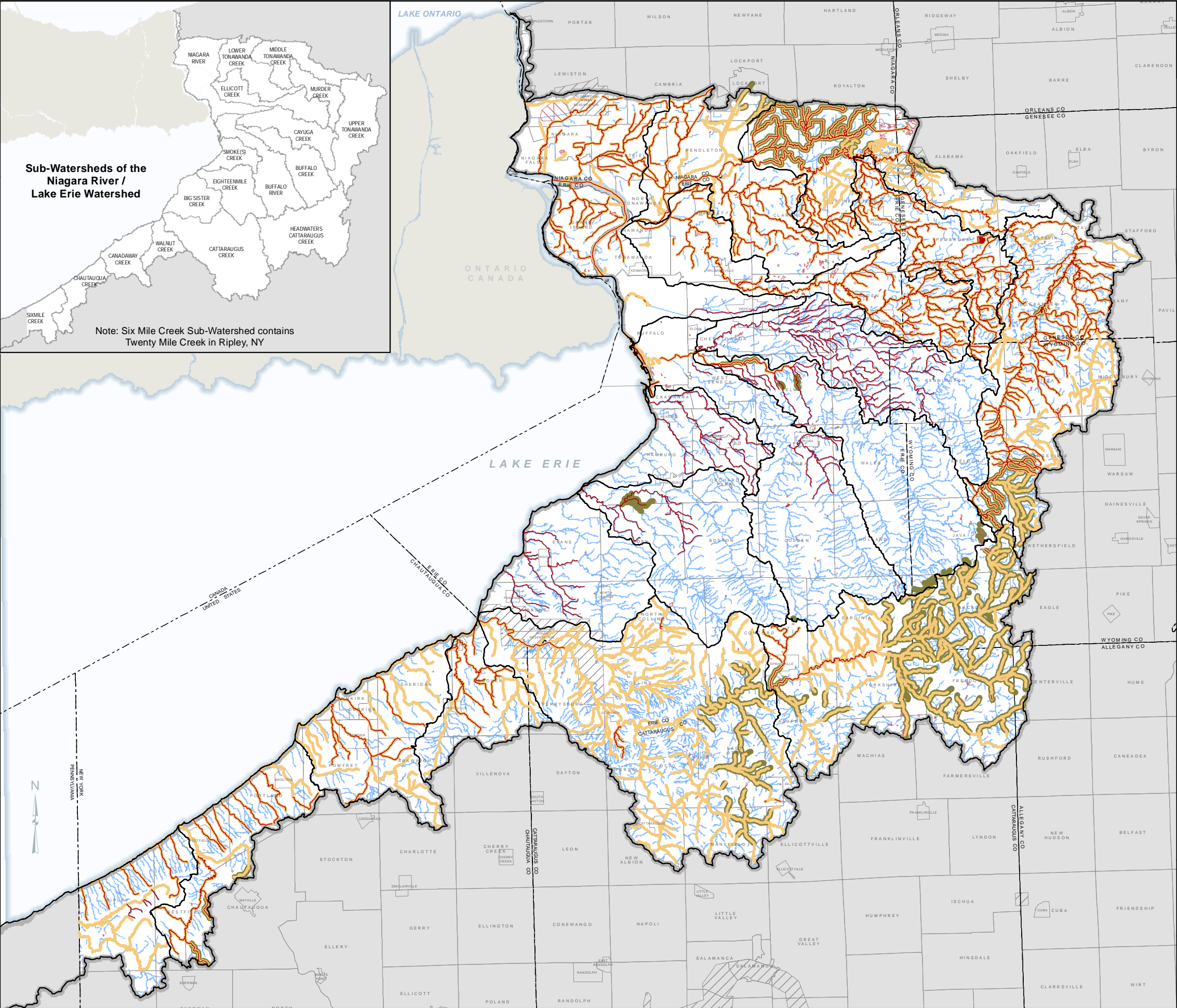
Forty-three Areas of Concern have been identified within the Great Lakes: 26 located entirely within the United States; 12 located wholly within Canada; and five that are shared by both countries. RAPs are being developed for each of these AOCs to address impairments to any one of 14 beneficial uses (e.g., restrictions on fish and wildlife consumption, dredging activities, or drinking water consumption) associated with these areas.

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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Regional Niagara River / Lake Erie Watershed Management Plan

ENVIRONMENTAL PROTECTION AGENCY IMPAIRED WATERS

303(d) Listed Impaired Waters

EPA Fish Consumption Advisory

EPA Fish Consumption Advisory

EPA Nonpoint Source Project

Sub-Watershed Boundary

County

Project Area

Municipality

Indian Reservation

Waterways

5 2.5 0 5 10

Miles

5 2.5 0 5 10

Kilometers




The 305(b) program system provide assessed water data and assessed water features respectively. May 2015


The Fish Consumption Advisories dataset contains information on Fish Advisory events that have been indexed to the National Hydrography Dataset (NHD) Reach Addressing Database (RAD). June 2007

Watershed Boundaries for the 2002 Impaired Waters Baseline National Geospatial Dataset were developed by EPA due to widespread interest in GIS data on impaired waters and their watersheds. 2015

Sub-Watersheds and names are based on the U.S. Geological Survey 10-Digit Hydrologic Unit Codes (HUC).

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