

## Section 1: INTRODUCTION

*“Over the past two years, New York State has been hit by some of the most destructive storms in the state’s history, causing untold damage and the tragic loss of many lives. Regardless of the cause of these storms, New York State must undertake major reforms to adapt to the reality that storms such as Sandy, Irene, and Lee can hit the state at any time.”*

*-Governor Andrew M. Cuomo*

The effects of Hurricane Irene, Tropical Storm Lee and Hurricane Sandy have taken an immense toll on the citizens, businesses, and government of the State of New York. Ordinarily, the period covered by the 2014 State Hazard Mitigation Plan (SHMP) update would already have been noteworthy for several incidents, including not only Hurricane Irene and Tropical Storm Lee, with Hurricane Irene representing the most costly disaster to date in New York State at the time, but also with brush fires in April 2012 that occurred in 16 counties and New York City, affecting over 1,100 acres in four municipalities in Suffolk County and approximately 550 acres in the Harriman State Park in Rockland County; the line of severe thunderstorms in late July 2012 that caused power outages for over 100,000 New Yorkers and spawned a tornado in Chemung County, resulting in severe damage in downtown Elmira; and the industrial fire in the Town of Ghent in Columbia County, involving potentially hazardous materials and necessitating the ordered evacuation of residents living within a one-mile radius of the fire (as well as residents in neighboring Berkshire County, Massachusetts, living within 15 miles of the fire who were recommended to “shelter-in-place” due to the track of the plume from the fire).

But all of these events were eclipsed by the most catastrophic storm in the State’s history: Hurricane Sandy. The storm caused once-in-a-generation flooding and catastrophic power outages, bringing down power lines, uprooting trees, and forcing the evacuation of close to half a million people in New York City and Long Island from their homes and businesses. With the impact of Hurricane Irene and Tropical Storm Lee still being felt throughout the State, Hurricane Sandy tore into the State with an unprecedented level of ferocity and fury. The amount of damage caused by Sandy was of a level never before experienced in New York State and the impact will be felt for years to come.<sup>1</sup>

*We will never be able to perfectly predict or prevent all extreme events or eventualities. Therefore, we must conserve and develop those systems that can most quickly respond to, and most effectively rebound from, severe weather events and other emergencies. Building resilience will enable us to avoid unmanageable impacts, while managing the risks that the future will no doubt present.*

*-New York State 2100 Commission Report*

<sup>1</sup> New York State Disaster Preparedness Commission 2012 Annual Report



The value of mitigation planning is increasingly evident as disasters seem to occur more frequently and the financial resources to rebuild remain scarce. Since it was approved by FEMA and adopted by the New York State Disaster Preparedness Commission (DPC) on January 4, 2011, the 2011 New York State Hazard Mitigation Plan (SHMP) has allowed eligible State agencies, local governments, and eligible private non-profits to access federal disaster assistance related to more than \$7.2 billion in damages.

**In addition to meeting planning requirements that allows New York State to access financial resources for mitigation, the SHMP serves to:**

- Document New York's progress in identifying risks and mitigating natural hazards to avoid the loss of life and injury and reduce the damage to state-owned and -managed infrastructure.
- Provide a reference document and information source for local governments as they develop local hazard mitigation plans to reduce their own levels of risk and to access the full suite of federal disaster funding.

As New York State's communities continue to grow, hazard mitigation will play an even more important role in the government's primary objective of protecting its citizens' health, safety, and welfare. In short, hazard mitigation is sound fiscal policy in good times and bad.

## 1.1 Prerequisites

The Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390)<sup>2</sup> provides an opportunity for states, territories, tribes, and local governments to take a new and revitalized approach to mitigation planning. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act) by repealing the previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). This new section emphasizes the need for state, territorial, tribal, and local entities to closely coordinate mitigation planning and implementation efforts. It continues the requirement for a state mitigation plan as a condition of disaster assistance, and creates incentives for increased coordination and integration of mitigation activities at the State level.

To implement the DMA 2000 planning requirements, FEMA published an Interim Final Rule (the Rule) in the Federal Register on February 26, 2002. This Rule (44 CFR Part 201) established the mitigation planning requirements for states, tribes, and local governments.

The Rule serves as the governing set of requirements for DMA 2000 planning implementation. In accordance with the Rule (44 CFR Part 201), this plan is the scheduled 2014 update to New York's Standard State Mitigation Plan, which was initiated through approval by FEMA in January 2005.<sup>3</sup>

<sup>2</sup> FEMA <http://www.fema.gov/media-library/assets/documents/4596?id=1935>

<sup>3</sup> Multi-Hazard Mitigation Planning Guidance



**Standard State Mitigation Plans (201.4 of the Rule):** To receive federal mitigation funds, states must develop and submit for approval to FEMA a Standard Hazard Mitigation Plan that includes details of the State's natural hazards risks, vulnerabilities, and mitigation goals, objectives, and priorities.

States with an approved Standard Hazard Mitigation Plan qualify for federal Hazard Mitigation Assistance (HMA),<sup>4</sup> which includes the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program and the Flood Mitigation Assistance (FMA) program. Together, these programs provide significant opportunities to reduce or eliminate potential losses to state and local governments in New York State through hazard mitigation planning and project grant funding.<sup>5</sup>

Mitigation opportunities are also available through the FEMA Public Assistance (PA) program.<sup>6</sup> Through the PA program, FEMA provides supplemental federal disaster assistance for debris removal, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain private non-profit (PNP) organizations.

These programs are further described in **Section 4: Mitigation Strategy** of this plan.

## 1.2 Plan Adoption Process

**Requirement §201.4(c)(6):** *The plan **must** be formally adopted by the State prior to submittal to [FEMA] for final review and approval.*

The 2014 SHMP will be adopted in accordance with the 44 CFR 201.4(c)(6) and the New York State Executive Law, Article 2-B, as amended, which gives adoption authority to the DPC.<sup>7</sup>

The New York State DPC is comprised of the commissioners, directors, or chairpersons of 32 state agencies and one volunteer organization, the American Red Cross. The responsibilities of the DPC include the preparation of state disaster plans; the direction of state disaster operations and coordination of those with local government operations; and the coordination of federal, state and private recovery efforts. New York State Executive Law, Article 2-B, Section 21 enacted in 1978, shifted emphasis from civil defense to all-hazards preparedness activities and missions; created the DPC; and assigned responsibility for off-site radiological emergency preparedness for commercial nuclear power plants.

<sup>4</sup> FEMA <http://www.fema.gov/hazard-mitigation-assistance>

<sup>5</sup> Hazard Mitigation Assistance Unified Guidance

<sup>6</sup> FEMA <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>

<sup>7</sup> New York State 2013 Hazard Mitigation Plan approval letter



The Commissioner of the Division of Homeland Security and Emergency Services (DHSES) serves as the Chair of the DPC. As the Governor's Authorized Representative (GAR) or Alternate GAR on major disasters, the DHSES Commissioner facilitates the adoption of the mitigation plan by the members of the DPC on behalf of the State.

**The DPC member agencies are comprised of the following:**

- Department of Agriculture and Markets
- Division of Homeland Security and Emergency Services
- Office of Children and Family Services
- Office of Interoperability and Emergency Communications
- Commissioner of Division of Criminal Justice Services
- Office of Parks, Recreation and Historic Preservation
- Department of Corrections and Community Supervision
- Office of People with Developmental Disabilities
- Department of Financial Services
- Office of Information Technology Services
- Education Department
- Office of Victim Services
- Empire State Development Corporation
- Port Authority of New York and New Jersey
- Energy Research and Development Authority
- Public Service Commission
- Department of Environmental Conservation
- Department of State
- Office of Fire Prevention and Control
- Division of State Police
- Office of General Services
- Office of Temporary and Disability Assistance
- Department of Health
- Thruway Authority
- Division of Housing and Community Renewal
- American Red Cross
- Department of Labor
- Metropolitan Transportation Authority
- Office of Mental Health
- Department of Transportation
- Division of Military and Naval Affairs



In July 2010, the NYS Legislature consolidated the Offices of Counter Terrorism, Emergency Management, Fire Prevention and Control, Information Technology Services, and Interoperable & Emergency Communications into DHSES. The Division is dedicated to protecting New Yorkers, their property, and the State's economic well-being from acts of terrorism as well as natural and human-caused emergencies or disasters. Soon after Hurricane Sandy struck in 2012, the Public Assistance (PA), Individual Assistance (IA), and all-hazard mitigation planning and project grants management functions originally housed in the Office of Emergency Management (OEM) were moved under direct DHSES oversight. Thus, many hazard mitigation activities attributed to State OEM in earlier versions of the State Hazard Mitigation Plan now fall to DHSES.

Overall administration of the hazard mitigation program is the responsibility of the DHSES Mitigation Section. The Mitigation Section oversees the HMGP, PDM and FMA programs. The Mitigation Section also facilitates community mitigation planning. **Duties of the Mitigation Section include, but are not limited to, the following:**

- Implementing and updating the State Hazard Mitigation Plan
- Working with federal, state, and local agencies in the implementation of hazard mitigation plans
- Administering the Hazard Mitigation Grant Program
- Administering the Pre-Disaster Mitigation Program
- Administering the Flood Mitigation Assistance Program
- Providing technical assistance and training programs to state and local personnel
- Coordinating mitigation operations following disaster declarations
- Keeping abreast of mitigation requirements and technologies and transferring them to local governments and other interested parties
- Serving on various federal, regional, and state panels or committees for the development, implementation and promotion of hazard mitigation initiatives
- Working in conjunction with state agencies to promote state and federal programs that result in mitigation.

The Mitigation Section will review the plan annually or as needed if hazard mitigation regulations or guidelines change. The adoption of the 2008 New York State Hazard Mitigation Plan was received by FEMA on January 2, 2008. The plan was approved by FEMA on January 4, 2008. The 2011 update of the New York State Hazard Mitigation Plan was adopted by the State on January 3, 2011, and was approved by FEMA on January 4, 2011. The 2014 plan adoption process followed the same approach used in previous cycles. The plan was approved by FEMA and adopted by the DPC on December 18, 2014. The plan will be updated every three years or as required.

New York State and the DPC will comply with the actions of the plan and will maintain and update the plan in keeping with the processes specified in **Section 6: Plan Maintenance**. The official adoption documents will be included in the plan after FEMA's final review and conditional approval.



### 1.3 Planning Process

The SHMP represents the State's systematic approach to mitigating the adverse impacts of natural disasters and extent of vulnerability within its borders, and fulfilling its obligations to mitigate the risks resulting from natural hazards. It sets forth the policies, strategies, goals, and objectives that will be used to establish and implement hazard mitigation activities within the State. It will also serve as a guide to local jurisdictions in completing their local hazard mitigation plans (LHMPs). In addition, local plan development tools can be found in **Appendix 5**.

Effective and consistent implementation of this plan is crucial to the hazard mitigation program and the State's efforts to reduce or eliminate their vulnerability to future disasters. This plan incorporates all changes associated with the implementation of the federal/state hazard mitigation program, including the applicable sections of the DMA 2000. In addition, it is consistent with the appropriate standards of the Emergency Management Accreditation Program (EMAP) through identification of all natural hazards, the comprehensive risk assessment, and the mitigation program and plan (EMAP Appendix provides a review of the SHMP in relation to the EMAP standards for hazard identification, risk assessment and mitigation).

#### Organization of the Plan

The plan is organized to parallel the structure provided in the Rule. **The plan has seven sections and is followed by seven appendices that link to each section:**

- **Section 1:** Introduction and Prerequisites
- **Section 2:** Planning Process
- **Section 3:** Hazard Identification and Risk Assessment
- **Section 4:** Mitigation Strategy
- **Section 5:** Coordination of Local Planning
- **Section 6:** Plan Maintenance
- **Section 7:** Severe Repetitive Loss Strategy
- Appendices

#### Highlights of the 2014 SHMP include:

- Extended risk assessment with the addition of: avalanche, climate change, coastal erosion, and tsunami
- Ranking of the identified hazards
  - The DHSES Planning Section provides support for the use of the State's hazard analysis software (HAZNY), which has become a tool for local communities preparing DMA 2000 LHMPs. During the 2014 SHMP update process, HAZNY was used in a modified format as the hazard ranking tool. This process used the general HAZNY criteria in a manner consistent with the local hazard ranking methodology, but added a weighting factor for



mitigation potential to determine the final hazard score. (See **Section 3.2.1 – Ranking Methodology** for a description of the ranking methodology used for the 2014 SHMP).

- Modified goals that provide an updated framework that determines actions and activities
- A statewide approach to mitigation actions and activities that reduces vulnerabilities and limits losses.

The hazards profiled are limited to natural hazards as detailed in **Section 3.0: Hazard Identification and Risk Assessment**. This plan represents Volume 1 of the New York State Comprehensive Emergency Management Plan (CEMP), but individuals or jurisdictions interested in information about human-caused, technological, or biological hazards may find information in Volume 2 of the CEMP. Additional information about the CEMP and its critical annexes, such as Pandemic Influenza, Terrorism, and Hazardous Materials may be found in Volume 2 or on related State agency websites, such as the New York State Department of Health, New York State Office of Counter Terrorism, or similar federal websites.

## 1.4 Compliance with Federal and State Regulations

***Requirement §201.4(c)(7):** The plan **must** include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).*

This plan complies with the requirements of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (as amended by the DMA 2000); all pertinent presidential directives associated with the U.S. Department of Homeland Security and FEMA; all aspects of 44 CFR pertaining to hazard mitigation planning and grants pertaining to the mitigation of adverse effects of natural disasters; interim final rules and final rules pertaining to hazard mitigation planning and grants, as described above; all planning criteria issued by FEMA; and all Office of Management and Budget circulars and other federal government documents, guidelines, and rules.

The State of New York agrees to comply with all federal statutes and regulations in effect with respect to mitigation grants it receives, in compliance with 44 CFR 13.11(c). As stated in **Section 1.2 - Plan Adoption**, the plan will be updated every three years or as required, and amendments will be made as necessary to address changes in federal or state statutes, regulations, and policies. Such amendments will be submitted to FEMA for approval. Additional information about how the plan will be reviewed and updated is in **Section 6: Plan Maintenance**.



DHSES intends to comply with all administrative requirements outlined in 44 CFR 13 and 206 in their entirety and to monitor all subgrant-supported activities to ensure compliance with 44 CFR 13 and 206 in their entirety.

## **Governing Authorities**

### **New York State**

#### **Constitution**

- New York State Constitution

#### **State Laws**

##### *Executive*

- New York State Law, Executive Article 2-B, as amended
- New York State Law, Executive Article 42 (910 – 923), Waterfront Revitalization Of Coastal Areas And Inland Waterways

##### *Consolidated Laws*

- New York State Canal Law
- New York State Defense Emergency Act (4/12/51), as amended
- New York State Finance Law
- New York State Freshwater Wetlands Act of 1973
- New York State Highway Law, Sections 10, 12, 16, 42a, 55, 64, 104, 269, 340-b and other miscellaneous provisions
- New York State Interstate Civil Defense and Disaster Compact, Chapter 674 (1951)
- New York State Parks, Recreation and Historic Preservation Law (historic properties)
- New York State Public Authorities Law
- New York State Public Service Law, Sections 65 and 66
- New York State Tidal Wetlands Act of 1973
- New York State Environmental Conservation Law (ECL), Part 53: Tree Conservation and Urban Forestry
- New York State Environmental Conservation Law (ECL), Parts 215, Open Fires
- New York State Environmental Conservation Law (ECL), Part 673: Dam Safety Regulations

##### *New York Codes, Rules and Regulation (NYCRR)*

- 6NYCRR Part 360 & 750, Environmental Conservation Law (ECL) Article 3, Title 3; Article 17, Titles 3, 5, 7, 8; Article 70, Title 1; and the Federal Water Pollution Control Act, 33 USC 1251, et seq
- 6NYCRR Part 505, Coastal Erosion Management Regulations (authority ECL Article 34)



- 6NYCRR Part 617, State Environmental Quality Review Act
- 6NYCRR Part 601 and 621, Uniform Procedures Act (authority ECL section 70-0107)
- 16NYCRR, Part 105, New York State Public Service Commission Rulemaking, Chapter II, Electric Utility Emergency Plans

## Federal

### *Laws*

- The National Security Act of 1947
- Public Law 84-99 (33 USC 701n) for flood emergencies
- Public Law 85-256, Price-Anderson Act
- Public Law 89-665 (16 USC 470 et seq.), National Historic Preservation Act
- Public Law 90-448, National Flood Insurance Act of 1968 (42 USC 4001 et seq.)
- Public Law 91-646, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- (42 U.S.C. 4601 et seq.)
- Public Law 93-288, as amended by Public Law 100-707, The Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 6121 et seq.)
- Public Law 93-234, Flood Disaster Protection Act of 1973
- Public Law 95-124, as amended by Public Laws 96-472 and 99-105, Earthquake Hazards Reduction Act of 1977 (42 USC 7701 and 7704)
- Public Law 96-295, The Nuclear Regulatory Commission Appropriations Authorization Act
- Public Law 96-510, Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Section 104(i),(42 USC 9604(i))
- Public Law 99-499, Superfund Amendments and Reauthorization Act of 1986
- Public Law 101-615, Hazardous Materials Transportation Uniform Safety Act
- Public Law 101-549, Clean Air Amendments of 1990
- Public Law 107-296, Homeland Security Act of 2002
- Public Law 108-264, Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004
- Public Law 113-2, Department of Housing and Urban Development Appropriations Act, 2013
- Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12)

### *Administrative Rules*

- 44 CFR Part 9, Floodplain Management and Protection of Wetlands
- 44 CFR Part 10, Environmental Considerations
- 44 CFR Part 13 (The Common Rule), Uniform Administrative Requirements for Grants and Cooperative Agreements
- 44 CFR Part 14, Audits of State and Local Governments
- 44 CFR Parts 59-76, National Flood Insurance Program and related programs
- 44 CFR Part 201, Mitigation Planning
- 44 CFR Part 206, Federal Disaster Assistance for Disasters Declared after November 23, 1988



- 49 CFR Part 24, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs

#### *Executive Orders*

- Executive Order 11988, Floodplain Management
- Executive Order 11990, Protection of Wetlands
- Executive Order 12656, Assignment of Emergency Preparedness Responsibilities
- Executive Order 12148, Federal Emergency Management
- Executive Order 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Homeland Security Presidential Directive 5, Management of Domestic Incidents, February 28, 2003
- Homeland Security Presidential Directive 8, National Preparedness, December 17, 2003.

#### References

- Emergency Management Accreditation Program
  - Hazard Identification and Risk Assessment Standards 4.3.1 and 4.3.2
  - Hazard Mitigation Standards 4.4.1, 4.4.2, 4.4.3, 4.4.4 and 4.4.5

## 1.5 Plan Summary and Section Update

**Section 1: Introduction** – presents and summarizes each section of the SHMP, and also includes selected background information about New York State, including topography and demographics.

**Section 2: Planning Process** - explains the process used to develop the 2014 SHMP, including the coordination efforts among state agencies, appropriate federal agencies, local jurisdictions, and other interested groups. This collaboration has been integrated to the extent possible with other ongoing state planning efforts, as well as other FEMA mitigation programs and initiatives.

**Section 3: Hazard Identification and Risk Assessment** - provides the factual basis for activities proposed in the strategy for the mitigation plan. The risk assessment characterizes and analyzes natural hazards and risks to provide a statewide overview. This overview allows the State to compare potential losses throughout the State, to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk assessment and vulnerability assessments.

Also in this risk assessment is an overview of the locations of all hazards that can affect the State, using maps where appropriate and including information on previous occurrences of



hazard events and the probability of future hazard events. This section also gives a description of vulnerabilities in terms of the jurisdictions most threatened by the identified hazards and most vulnerable in relation to people, property, environment, and economy associated with hazard events. Also in this section:

- The estimated potential losses, with an overview and analysis to the identified vulnerable structures based on estimates provided in state and local risk assessments
- The State's estimation of potential dollar losses by jurisdiction and to state-owned or -operated buildings, infrastructure, and critical facilities located in the identified hazard areas
- A description of any changes in development trends in relation to natural hazards

**Section 4: Mitigation Strategy** - provides the State's blueprint for reducing the losses identified in the risk assessment. The mitigation strategy is a description of the State goals that guide the selection of activities to mitigate and reduce potential losses. Goals selected for the 2014 SHMP include:

- Goal 1:** Promote a comprehensive state hazard mitigation policy framework for effective mitigation programs that includes coordination between federal, state, and local organizations for planning and programs.
- Goal 2:** Protect property including public, historic, private structures, and critical facilities and infrastructure.
- Goal 3:** Increase awareness and promote relationships with stakeholders, citizens, elected officials, and property owners to develop opportunities for mitigation of natural hazards.
- Goal 4:** Encourage the development and implementation of long-term, cost-effective, and resilient mitigation projects to preserve and/or restore the functions of natural systems.
- Goal 5:** Build stronger by promoting mitigation actions that emphasize sustainable construction and design measures to reduce or eliminate the impacts of natural hazards.

This section reflects progress in statewide mitigation efforts and changes in priorities, and describes the State's pre- and post-disaster hazard mitigation policies, programs, and capabilities to mitigate area hazards, including evaluation of state laws, regulations, policies and programs related to hazard mitigation; program development in hazard-prone areas; and state funding capabilities for hazard mitigation projects. The section also includes identification, evaluation, and ranking of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section also provides a list of potential federal, state, local, and other funding sources.



**Section 5: Coordination of Local Mitigation Planning** - details the State's process to support and coordinate, through funding and technical assistance, the development of local mitigation plans and projects. The description of the State's process and timeframe by which the local plans will be reviewed, coordinated, and linked to the SHMP is described, as well as the criteria for prioritizing communities and local jurisdictions that would receive funding.

**Section 6: Plan Maintenance Process** - includes the established method and schedule for monitoring, evaluating, and updating the plan. This includes a system for monitoring and evaluating implementation of mitigation measures and activities. The State's system for reviewing progress on goals is included in this section as well.

**Section 7: Severe Repetitive Loss Strategy** - describes the State's repetitive loss flood mitigation strategy, identifying specific actions the State has taken to reduce the number of repetitive loss and severe repetitive loss properties, and specifies how the State intends to reduce the number of such properties in the future.

## 1.6 About New York State

New York State Facts	
State Capital	Albany
Population	19,570,261
Land Area	47,223,839 square miles
Inland Water	7,247,305 square miles
Depth (North-South)	310 miles
Length (East-West)	440 miles, including Long Island
Counties	62 (See Figure 1b)
Number of Cities	62
Number of Villages	553
Number of Towns	932
State and Local Roads	112,956.17 miles
State Roads	16,489.91 miles
Local Roads	96,466.26 miles
Number of Hospitals	259 estimated
Highest Point	Mount Marcy, 5,344 feet above sea level
Lakes, Ponds and Reservoirs	Over 6,700
Largest City	New York City, 2012 population estimate is 8,336,697 (See Table 1c for population density)
Largest Park	The Adirondack Park (larger than Yellowstone, Yosemite, Grand Canyon, Glacier, and Olympic National Parks combined)
Largest Lake (within State borders)	Oneida, 79.8 square miles
Longest River	Hudson, 315 miles, which is influenced by tidal waters as far north as Troy, 157 miles north of New York City
Longest Toll Expressway in the World	Governor Thomas E. Dewey Thruway, 559 miles
State Motto	"Excelsior", which is Latin for "Ever Upward"

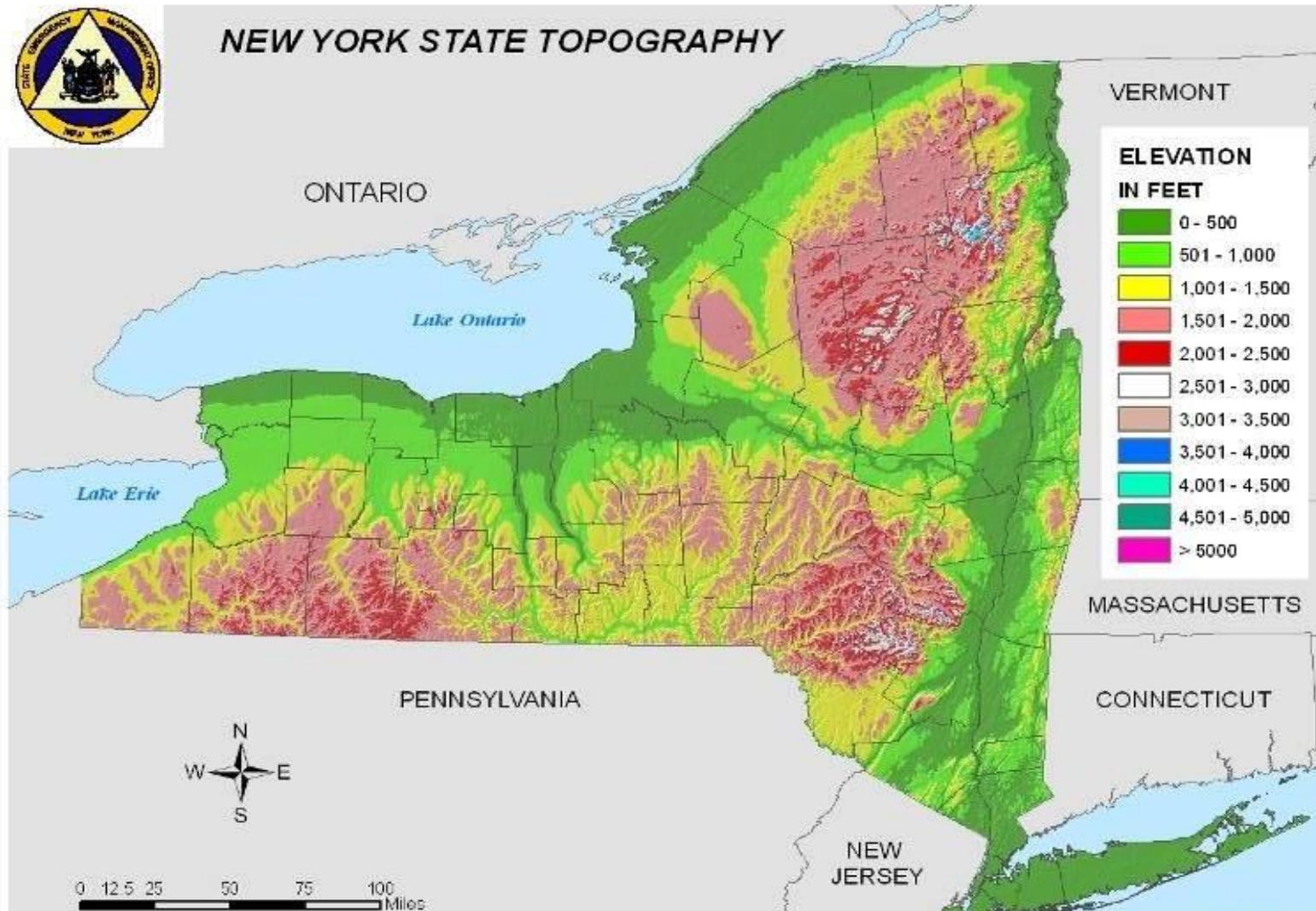


New York State Facts	
State Nickname	The Empire State

The total area of New York State is 54,471,144 square miles (47,223,839 in land and 7,247,305 in inland water). There are four mountain ranges in New York State: the Adirondacks in the North, the Catskill and Shawangunk ranges in the South Central, and the Taconic in the East. The highest point in New York State is Mount Marcy, located in the Adirondacks in Essex County, at 5,344 feet above sea level. A topographic map of New York State is shown in **Figure 1.6a**.



**Figure 1.6a: New York State Topography**



## **Bodies of Water**

There are 6,713 natural ponds, lakes, and reservoirs of one acre or more, 76 with an area of one square mile or more. There are 1,745 square miles of inland water, including some 4,000 lakes, ponds, and reservoirs.

The State has 70,000 miles of rivers and streams; 127 miles of Atlantic Ocean coastline; and 9,767 miles of total shoreline, which includes 8,778 miles of lake shoreline, 231 miles of shorefront on the Long Island Sound, 548 miles of beachfront in the Long Island area, and 83 miles of coastal barrier islands off Long Island.

Crossing the State from east to west, the New York State Barge Canal System is the longest internal waterway system in any state (800 miles), carrying over 2 million tons of cargo per year.

### **Rivers**

The State has approximately 70,000 miles of rivers and streams, with the majority of these located along the Hudson River Valley.

### **Longest River**

The Hudson River is the longest river in the State at 306 miles long and it drains an area of 13,370 square miles. Its average discharge is 21,500 cubic feet per second. The Hudson's most distant source is in Essex County, the Adirondack Mountains. Lake Tear of the Clouds is the highest lake in the State – 4,320 feet above sea level – and is considered the source of the Hudson River. The Hudson empties into the Atlantic Ocean at New York City.

### **Greatest Volume**

The Niagara River has the highest flow, spilling 40 million gallons of water 180 feet downward each minute across a ledge nearly 2/3 of a mile wide at Niagara Falls.

### **Lakes**

There are over 6,700 natural ponds, lakes and reservoirs of one acre or more in the State of New York. There are 76 lakes with an area equal to or greater than one square mile and there are 10 natural fresh-water lakes of 10 square miles or more.

- Oneida Lake, at 79.8 square miles, is the largest lake completely within the state. Other prominent lakes are the Finger Lakes, Otsego Lake, Lake George, Lake Placid, and Lake Champlain, which is 107 miles long.
- Lake Champlain, in Essex County, covers a 490-square-mile area and includes islands that total about 55 square miles.
- Lake Erie borders New York State for a linear distance of 64 miles. Its surface area in the U.S. totals 5,002 square miles.
- Lake Ontario forms the northern boundary of New York State and central Canada for a linear distance of 146 miles.



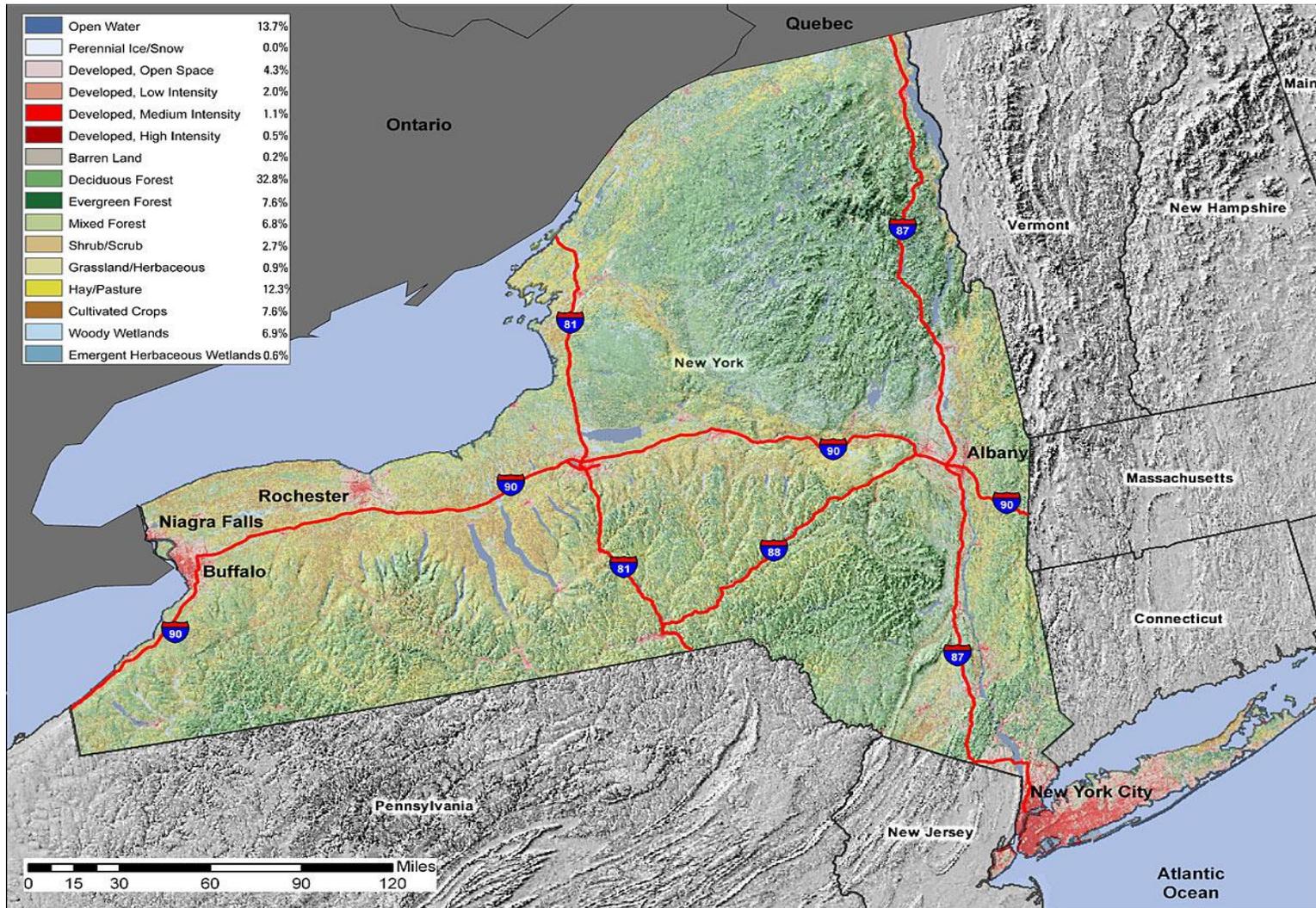
Although best known for its highly urbanized coastline, forests are the most common New York land cover type. Sugar maple, white ash, beech, and oak are some of the State's most prominent trees. A large proportion of the forests are located in the northern Adirondack Mountains, in particular, the Adirondack State Park. In addition, concentrations of forest cover are located throughout the southern Catskills Mountains and the Appalachian Uplands. New York borders two Great Lakes (Erie and Ontario) along with Lake Champlain in the northeast, the St. Lawrence River in the northwest, and the Atlantic Ocean in the southeast. The Hudson River is the primary river system in the state that includes its main tributary, the Mohawk River. The Finger Lakes in the west, a group of 11 glacially formed lakes, are among the State's primary inland bodies of water. These lakes provide drinking water for several local cities, and the area is the center of the State's wine industry. Urban development in New York City, Rochester, and Buffalo is significant. A land cover map of New York State is shown in **Figure 1.6b**.<sup>8</sup>

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<sup>8</sup> USGS Land Cover Institute (LCI) <http://landcover.usgs.gov/newyork.php>



**Figure 1.6b: New York State Land Cover**

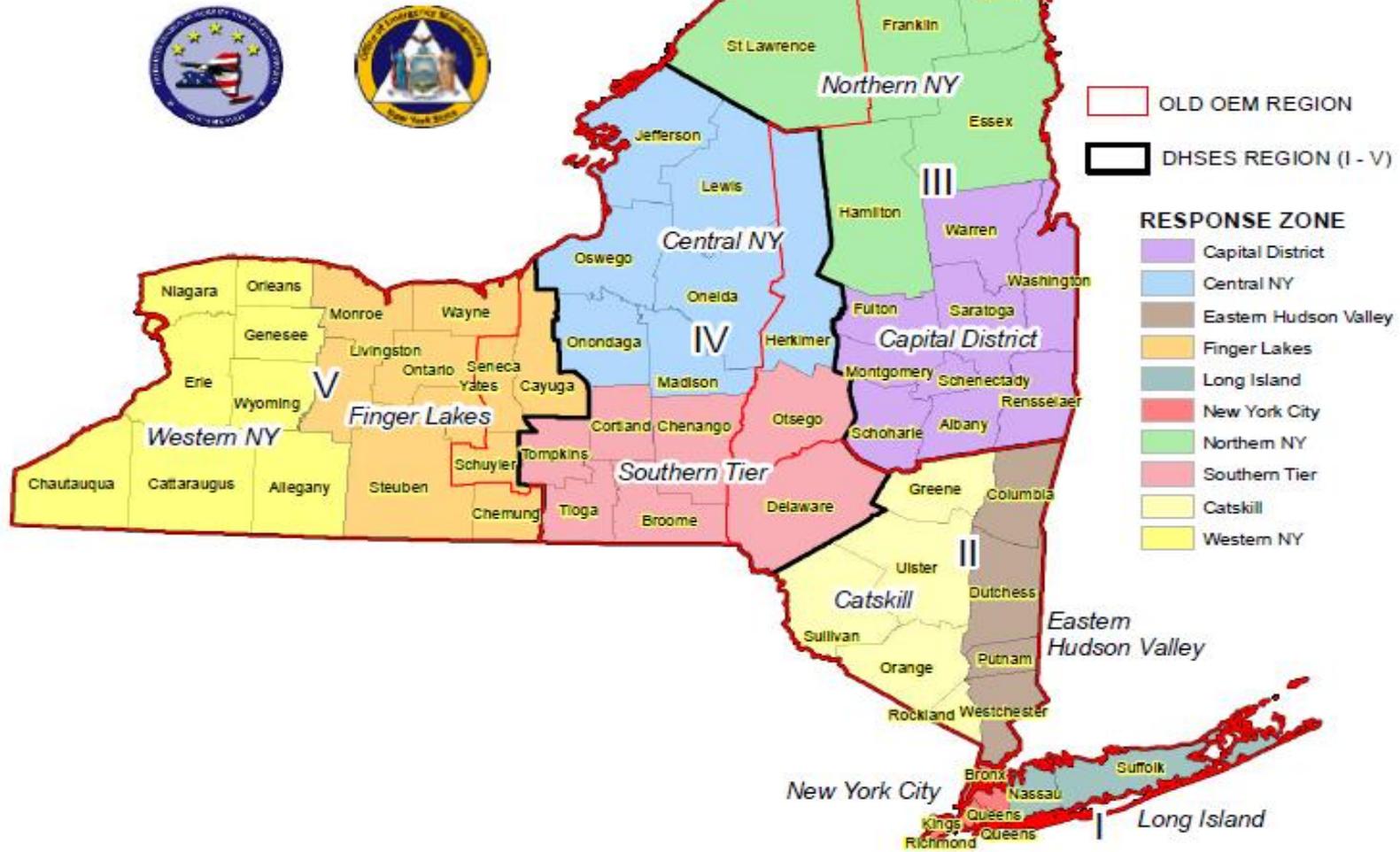


The State of New York State is comprised of 62 counties, and 62 cities, 932 towns, and 553 villages. The largest city in the state is comprised of five counties (boroughs): Bronx, New York (Manhattan), Queens, Kings (Brooklyn), and Richmond (Staten Island). The state has five DHSES regions; each region is divided into two response zones. A New York State county map is provided in **Figure 1.6c**, which illustrates the former regions in relation to the current revised DHSES regions and response zones.



Figure 1.6c: Counties in New York State

**New York State Division of Homeland Security and Emergency Services Regions**



**Table 1.6a** provides the population estimate from the 2010 Census and population change by county, from Census 2000 to Census 2010.<sup>9</sup> Population density derives from Census 2010, and housing unit estimates come from the American Census Survey 5-year estimate. The State's 19 million people are not evenly dispersed throughout its jurisdictional boundaries, neither are they equally exposed to the major hazards of the State. The majority of the population resides in the Southeastern and Western sections of the State, with significant populations residing along waterways such as the Atlantic Ocean, Long Island Sound, Lake Ontario, Lake Erie, and the numerous rivers and lakes.

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<sup>9</sup> New York 2010 Census Population and Housing Characteristics



Table 1.6a: New York 2010 Census Population and Housing Characteristics

County	Population 1990	Population 2000	Population 2010	% Change 2000-2010	Square Miles	2010 Pop Density (pop/area)	Housing Units 2010
Albany	292,594	294,565	304,204	3.3	533	571	136,810
Allegany	50,470	49,927	48,946	-2.0	1,035	47	25,908
Bronx	1,203,789	1,332,650	1,385,108	3.9	57	24,103	509,665
Broome	212,160	200,536	200,600	0.0	715	280	90,348
Cattaraugus	84,234	83,955	80,317	-4.3	1,324	61	41,032
Cayuga	82,313	81,963	80,026	-2.4	882	91	36,469
Chautauqua	141,895	139,750	134,905	-3.5	1,508	89	66,784
Chemung	95,195	91,070	88,830	-2.5	411	216	38,371
Chenango	51,768	51,401	50,477	-1.8	898	56	24,615
Clinton	85,969	79,894	82,128	2.8	1,117	74	35,523
Columbia	62,982	63,094	63,096	0.0	648	97	32,501
Cortland	48,963	48,599	49,336	1.5	501	98	20,515
Delaware	47,225	48,055	47,980	-0.2	1,467	33	30,890
Dutchess	259,462	280,150	297,488	6.2	825	361	116,946
Erie	968,532	950,265	919,040	-3.3	1,222	752	420,432
Essex	37,152	38,851	39,370	1.3	1,915	21	25,312
Franklin	46,540	51,134	51,599	0.9	1,696	30	25,149
Fulton	54,191	55,073	55,531	0.8	533	104	28,464
Genesee	60,060	60,370	60,079	-0.5	496	121	25,409
Greene	44,739	48,195	49,221	2.1	658	75	28,883
Hamilton	5,279	5,379	4,836	-10.1	1,806	3	8,555
Herkimer	65,797	64,427	64,519	0.1	1,456	44	33,219
Jefferson	110,943	111,738	116,229	4.0	1,756	66	57,168
Kings	2,300,664	2,465,326	2,504,700	1.6	97	25,783	986,482
Lewis	26,796	26,944	27,087	0.5	1,290	21	15,230
Livingston	62,372	64,328	65,393	1.7	641	102	26,774
Madison	69,120	69,441	73,442	5.8	661	111	31,243
Monroe	713,968	735,343	744,344	1.2	1,384	538	318,793



County	Population 1990	Population 2000	Population 2010	% Change 2000-2010	Square Miles	2010 Pop Density (pop/area)	Housing Units 2010
Montgomery	51,981	49,708	50,219	1.0	410	122	23,020
Nassau	1,287,348	1,334,544	1,339,532	0.4	447	2,999	466,721
New York	1,487,536	1,537,195	1,585,873	3.2	34	46,984	839,013
Niagara	220,756	219,846	216,469	-1.5	1,144	189	98,686
Oneida	250,836	235,469	234,878	-0.3	1,257	187	104,049
Onondaga	468,973	458,336	467,026	1.9	805	580	201,871
Ontario	95,101	100,224	107,931	7.7	663	163	47,290
Orange	307,647	341,367	372,813	9.2	838	445	135,562
Orleans	41,846	44,171	42,883	-2.9	814	53	18,300
Oswego	121,771	122,377	122,109	-0.2	1,401	87	53,652
Otsego	60,517	61,676	62,259	0.9	1,014	61	30,725
Putnam	83,941	95,745	99,710	4.1	246	405	37,881
Queens	1,951,598	2,229,379	2,230,722	0.1	179	12,464	832,357
Rensselaer	154,429	152,538	159,429	4.5	665	240	70,891
Richmond	378,977	443,728	468,730	5.6	102	4,582	175,907
Rockland	265,475	286,753	311,687	8.7	199	1,564	102,533
Saratoga	181,276	200,635	219,607	9.5	844	260	97,153
Schenectady	149,285	146,555	154,727	5.6	210	739	67,701
Schoharie	31,859	31,582	32,749	3.7	626	52	17,065
Schuyler	18,662	19,224	18,343	-4.6	342	54	9,424
Seneca	33,683	33,342	35,251	5.7	390	90	15,810
St Lawrence	111,974	111,931	111,944	0.0	2,819	40	51,845
Steuben	99,088	98,726	98,990	0.3	1,404	71	48,562
Suffolk	1,321,864	1,419,369	1,493,350	5.2	2,373	629	564,684
Sullivan	69,277	73,966	77,547	4.8	996	78	48,675
Tioga	52,337	51,784	51,125	-1.3	522	98	22,109
Tompkins	94,097	96,501	101,564	5.2	491	207	41,381
Ulster	165,304	177,749	182,493	2.7	1,161	157	83,007
Warren	59,209	63,303	65,707	3.8	931	71	38,343
Washington	59,330	61,042	63,216	3.6	846	75	28,626
Wayne	89,123	93,765	93,772	0.0	1,396	67	40,825



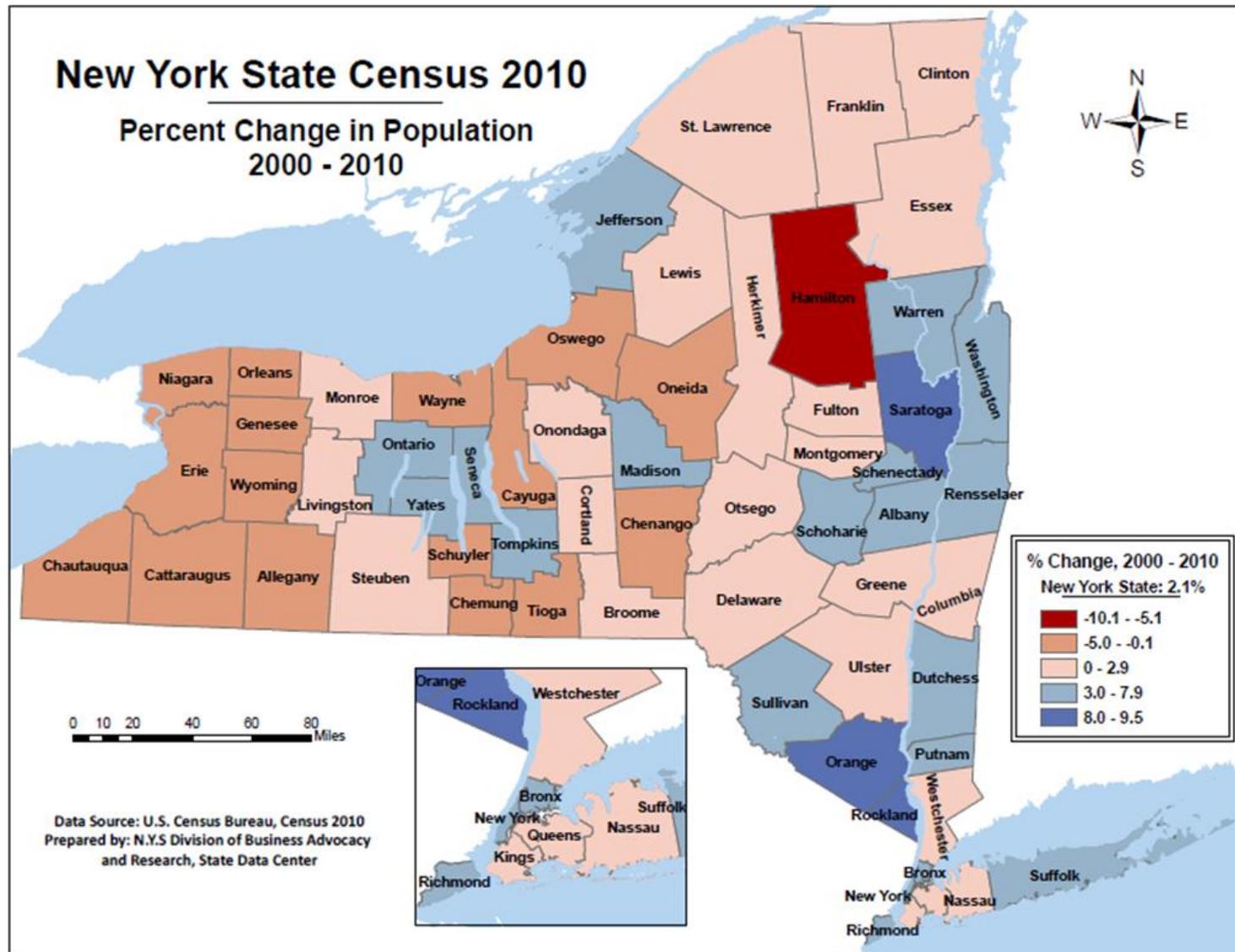
County	Population 1990	Population 2000	Population 2010	% Change 2000-2010	Square Miles	2010 Pop Density (pop/area)	Housing Units 2010
<b>Westchester</b>	874,866	923,459	949,113	2.8	500	1,898	368,498
<b>Wyoming</b>	42,507	43,424	42,155	-2.9	597	71	17,876
<b>Yates</b>	22,810	24,621	25,348	3.0	376	67	13,303
<b>Totals</b>	<b>17,990,455</b>	<b>18,976,457</b>	<b>19,378,102</b>	<b>96.6</b>	<b>54,574</b>	<b>129,797</b>	<b>8,085,835</b>



**Figure 1.6d** illustrates the percentage change from 2000-2010. Saratoga (9.5%), Orange (9.2%), and Rockland (8.7%) had the greatest increase in population, based on the U.S. Census data. Hamilton had the greatest loss of population at -10.1% during the same period.



Figure 1.6d: New York State Percent Change in Population



**Figure 1.6e** shows the State's population density by county. The five New York counties (New York, Kings, Bronx, Queens, and Richmond) are located on the State's urbanized coastline. Consequently the areas of the State most likely to experience major impacts from hazards such as hurricane, high wind, and flooding are also the most vulnerable.



Figure 1.6e: New York State Population Density

