

# Chapter 21. Adaptation and Resilience

## 21.1 Overview

Even with strong and innovative strategies in place to curb greenhouse gas (GHG) emissions, the impacts of climate change are already being felt and are only projected to accelerate. Climate change mitigation strategies alone are not sufficient to prepare for the impacts of present and future climate change. Therefore, New York State must take bold action to adapt to climate change and enhance resilience in communities, infrastructure, and systems.

Resilience is the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions. In human systems, adaptation is the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.<sup>329</sup>

Climate change impacts and the ability to adapt are distributed unevenly across different communities and population groups. Disadvantaged Communities and historically marginalized communities in particular often face greater risks while contending with historic socio-economic and environmental burdens and exposures. Underinvestment and historic injustices additionally limit available capacities and resources to effectively anticipate, plan for, and adapt to climate change. The strategies presented in this chapter emphasize equity in adaptation and resilience to address these historic and persistent injustices and inequities.

For energy systems, resilience is the ability of the energy infrastructure to be prepared for, withstand, adapt, and quickly recover from disruptions such as severe weather, natural, and man-made disasters. Adaptation is the process of adjusting to new climate conditions to reduce risks to valued assets.<sup>330</sup>

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<sup>329</sup> Intergovernmental Panel on Climate Change. 2012. “Glossary of terms.” In: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 555-564.

<sup>330</sup> United States Global Change Research Program. 2021. “U.S. Climate Resilience Toolkit.” Glossary. Accessed at <https://toolkit.climate.gov/content/glossary>.

This chapter contains strategies to enhance climate resilience and adaptation organized under three themes: building capacity, communities and infrastructure, and living systems.

## 21.2 Key Strategies

The components of the key strategies are derived from the initiatives and their respective components recommended to the Climate Action Council (Council) by the Land Use and Local Government Advisory Panel. A detailed description of the strategies and components can be found in Appendix H. The adaptation and resilience strategies are organized into three themes, listed below in Table 21.

**Table 21. Adaptation and Resilience Key Strategies by Theme**

Theme	Strategies
Build Capacity	<p>AR1. Commit to Creating, Implementing, and Updating a Comprehensive and Equitable State Climate Change Adaptation and Resilience Plan</p> <p>AR2. Incorporate Equitable Adaptation and Risk-Reduction Considerations into Relevant State Funding and Regulatory Programs, Projects, and Policies</p> <p>AR3. Strengthen Meaningful Community Engagement and Public Education and Build Adaptive Capacity across All Sectors</p> <p>AR4. Identify and Evaluate Options for Supporting Equitable Adaptation and Resilience Practices and Projects, and to Enhance Insurance Protection</p>
Enhance Community and Infrastructure Resilience	<p>AR5. Provide State Agency Planning and Technical Support for Equitable Regional and Local Adaptation and Resilience Plans and Projects</p> <p>AR6. Evaluate Opportunities to Ensure Equitable Consideration of Future Climate Conditions in Land Use Planning and Environmental Reviews</p> <p>AR7. Develop Policies, Programs, and Decision Support Tools to Reduce Risks Associated with Coastal and Inland Flooding</p> <p>AR8. Develop Policies and Programs to Reduce Human Risks Associated with New Patterns of Thermal Extremes</p> <p>AR9. Ensure the Reliability, Resilience, and Safety of the Energy System</p>
Enhance Resilience of Living Systems	<p>AR10. Develop Policies and Programs to Reduce Risks Threatening Ecosystems and Biodiversity</p> <p>AR11. Enhance Climate Resilience and Adaptive Capacity of the Agricultural Sector, while Preparing to Take Advantage of Emerging Opportunities</p> <p>AR12. Preserve and Protect the Ability of Forest Ecosystems to Sequester Carbon</p>

### **Priority Actions**

Each strategy comprises several actionable components. Actions that provide the leadership, direction, and resources necessary for New York to fully address its substantial vulnerabilities, while prioritizing equitable treatment for all, are listed here as the highest priority for implementation. These highest-priority actions are to appoint a Chief State Resilience Officer (CSRO); convene an adaptation and resilience sub-cabinet; develop a comprehensive State climate change adaptation and resilience plan based on a common vision of resilience; develop a policy on evaluation of equity and justice impacts of State adaptation and resilience decisions and of existing impacts of displacement and harm and provide

guidance on use of such evaluation to prioritize action in Disadvantaged Communities; establish a campaign to build public awareness and educate students from P-12 on the importance of climate change; and create a resilient infrastructure fund through bonding.

Additional actions that are important to ensure availability of information, financial resources, and regulatory authority to adapt to reduce risks associated with climate hazards are listed here as high priority. High-priority actions include continuing the ongoing update to New York's climate change assessment and initiating other research; adopting a process to ensure integration of State infrastructure investments to ensure efficient use of land and other resources and consideration of adaptation and resilience; reporting on options to enhance hazard mitigation funding, prefund disaster recovery, and transfer catastrophic risk to the insurance and capital markets; supporting development of local resilience, continuity, and adaptive capacity;<sup>331</sup> facilitating consideration of climate change in local regulatory and planning programs; and developing or updating guidance for mitigation of climate change risks in permit and State Environmental Quality Review Act (SEQRA) reviews.

State agencies must pay particular attention to ensuring the availability of resources, including federal funds distributed by the Federal Emergency Management Agency and other federal agencies, to enhance climate resilience in Disadvantaged Communities. Interagency coordination and consultation with affected communities to ensure effective delivery of these resources to Disadvantaged Communities will be critical to their success. The Climate Justice chapter summarizes strategies that apply to this chapter and include avoiding displacement of risk, equitable distribution of adaptation benefits, consideration of multiple, pre-existing or consecutively occurring exposures, and providing assistance to help Disadvantaged Communities overcome existing barriers.

### ***Indicators, Metrics and Monitoring***

Development and tracking of indicators and metrics will be critical components of planning and implementation of the recommended actions. Process metrics should be developed during work planning, and program plans and policies should include descriptions of indicators and metrics to be tracked and, where appropriate, reported. Indicators, metrics, and monitoring should be focused on outcomes and include indicators related to equity and benefit flows. However, as most of the following strategies

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<sup>331</sup> Adaptive capacity: The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities. IPCC Annex II. Glossary of Terms, Ibid. [https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex\\_Glossary.pdf](https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf)

comprise recommendations to develop plans, detailed discussion of indicators and metrics, and the means to monitor them, is beyond the scope of this document and premature for most of the recommended actions. Indicators, metrics, and monitoring programs should be developed during work planning for each recommended action. Resilience Metrics is one of numerous resources available regarding selection of indicators and metrics.<sup>332</sup>

### **Build Capacity**

The “build capacity” theme comprises four strategies related to statewide planning, consideration of future conditions in State decision-making, enhancement of general understanding of climate change, improving the public’s adaptive capacity, and identifying options for financing adaptation actions and reducing or shifting risk.

#### **AR1. Commit to Creating, Implementing, and Updating a Comprehensive and Equitable State Climate Change Adaptation and Resilience Plan**

New York is vulnerable to a variety of climate hazards, many of which will become more severe as the climate changes, and suffers substantial property loss, as indicated in Table 22. Note that the values reported in the table include only personal and public property losses and do not include long-term economic losses, medical costs, losses of social capital, community cohesion and capacities, or loss of life. Despite this vulnerability, New York has not committed substantial resources to comprehensive adaptation planning and coordination. Without the State’s commitment of resources, planning, and coordination, under-resourced and Disadvantaged Communities will continue to lack necessary resources and capacities to effectively anticipate, plan for and adapt to local impacts. The Council recommends that the State couple its nation-leading goals to mitigate climate change with similarly ambitious goals to adapt to it.

**Table 22. Average Annual Property Loss from Severe Hazard Events in New York, 1996–2017<sup>333</sup>**

<b>Hazard</b>	<b>Avg. loss</b>	<b>Hazard</b>	<b>Avg. loss</b>	<b>Hazard</b>	<b>Avg. loss</b>
Flooding	\$129,000,000	Ice Storm	\$4,070,000	Lightning	\$466,000
Wind	\$24,100,000	Coastal Hazards	3,750,000	Heat Wave	\$86,000
Snowstorm	\$15,500,000	Cold Wave	\$855,000	Tsunami/Seiche	\$22,000
Hail	\$3,600,000	Hurricane	\$758,000	Wildfire	\$8,720
Tornado	\$6,370,000				

<sup>332</sup> Resilience Metrics can be accessed at <http://resiliencemetrics.org/>.

<sup>333</sup> MitigateNY. “National Climatic Data Center Storm Events Dataset.” Accessed October 24, 2022 at <https://mitigateny.availabs.org/hazards,>.

## Components of the Strategy

- **Provide executive-level coordination of adaptation and resilience activities:** The Governor should appoint a Chief State Resilience Officer (CSRO) who would convene an adaptation and resilience sub-cabinet. Importantly, the CSRO’s portfolio must include all State adaptation and resilience activities, including oversight of relevant bond fund expenditures, and not be limited to disaster response. The CSRO must ensure incorporation of just transition principles into all adaptation and resilience activities and should report directly to the Director of State Operations. The adaptation and resilience sub-cabinet should comprise heads of relevant State agencies and authorities and be chaired by the CSRO.
- **Develop an adaptation and resilience plan:** The CSRO and adaptation and resilience sub-cabinet should oversee development of a comprehensive State climate change adaptation and resilience plan. This plan and the CSRO should ensure not only that programs are applied equitably, but that, as feasible, adaptation and resilience activities serve to ameliorate environmental, health, social, and economic inequities in historically marginalized communities and in Disadvantaged Communities. Planning should also include consultation with Indigenous Nations.
- **Complete vulnerability assessments and adaptation plans:** New York State Department of Environmental Conservation (DEC), with support from New York State Office of General Services (OGS), should complete preliminary agency vulnerability assessments and adaptation plans and identify and prioritize State adaptation and resilience projects.
- **Continue assessments and research:** The New York State Energy Research and Development Authority (NYSERDA) should continue its ongoing update to the climate change assessment, and DEC or other agencies should initiate or fund additional research.

### ***AR2. Incorporate Equitable Adaptation and Risk-Reduction Considerations into Relevant State Funding and Regulatory Programs, Projects, and Policies***

Incorporating equity into adaptation considerations in State programs is important for ensuring Disadvantaged Communities are protected against the effects of climate change and have the capacity and necessary resources to anticipate, plan for and adapt to climate impacts. Implementation of this strategy would be complementary to the goals of the Climate Justice chapter and include mainstreaming equity and justice considerations across programs, including proactive use of such programs to address economic and environmental inequities, consistent use of science-based projections in State decision-making,

consideration of lived experience and local expertise, and development of climate-resilient design guidelines for State-funded projects, among others.

## Components of the Strategy

- **Provide guidance on use of climate change projections:** DEC should release guidance describing projected climatic changes, including the inequitable distribution of risks, impacts and vulnerabilities, to support relevant decision-making.
- **Coordinate infrastructure investments:** The CSRO should provide recommendations to the Executive Chamber to adopt a process to ensure integration of federal, State, and local infrastructure investments to ensure efficient and equitable use of land and other resources, addressing historic and present climate and environmental injustices in infrastructure design, siting, and land use decisions, and consideration of adaptation and resilience.
- **Evaluate equity and justice:** The State should establish a comprehensive set of goals, processes, and selection criteria for identifying and implementing adaptation and resilience projects that involve meaningful community consultation and empowerment, especially in historically marginalized communities and Disadvantaged Communities; develop a formal policy on evaluation of equity and justice impacts of State adaptation and resilience decisions, including consideration of benefit flows and evaluation of outcomes; and provide guidance on use of such evaluation to prioritize action in Disadvantaged Communities.
- **Adopt resilient design guidelines:** OGS and DEC should convene a work group to adopt climate resilient design guidelines for State-funded projects.
- **Amend the Smart Growth Public Infrastructure Policy Act:** The State should amend the Smart Growth Public Infrastructure Policy Act and similar statutes to require consideration of climate hazards and climate equity and development of guidance by relevant agencies.
- **Enhance design capacity:** OGS should convene a work group to establish policies and procedures to require design professionals and contractors on State-funded projects to consider future climate conditions.
- **Assess climate vulnerabilities during land and water planning:** DEC, New York State Department of State (DOS), and other agencies that undertake or fund land or water planning activities should adopt policies to ensure all State land and water use plans include assessment of climate vulnerabilities and, as appropriate, strategies to promote resilience and reduce risk.

- **Enhance resilience of manufactured homes:** The State should review current safety codes and standards related to manufactured homes (including mobile homes) and consider the need for additional regulation, incentives or guidance to enhance resilience to climate hazards, particularly flooding, thermal extremes, indoor air quality, and high winds. As feasible, resilience programs for manufactured homes should be coordinated with programs to improve energy efficiency and access to sources of renewable energy.

### ***AR3. Strengthen Meaningful Community Engagement and Public Education and Build Adaptive Capacity across all Sectors***

Equitable participation in decision-making is particularly critical in adaptation and resilience planning to ensure that impacts and vulnerabilities are recognized and that climate risks are not displaced to communities that have historically been excluded from decision-making processes. Meaningful engagement processes, opportunities to participate in decision-making and capacity-building will be critical for local communities to successfully adapt to climate change. Public awareness of the need for the Climate Act and its implementing actions is critical to its ultimate success. Ensuring individual and household resilience will be crucial in reducing risks associated with climatic events. Climate adaptation provides significant opportunity for vocational training and job growth that can be targeted to vulnerable communities and those in transition from reliance on fossil fuel-based industries.

#### **Components of the Strategy**

- **Raise student and public awareness:** The State should convene a work group to establish a well-resourced campaign to build student and public awareness of climate change effects and solutions, provide workforce development and early career development opportunities, and effect beneficial lifestyle changes.
- **Provide disaster preparedness and response training for building operations staff:** NYSERDA and partner agencies should establish a program to train building operations staff in disaster preparedness and response.
- **Establish a resilience audit program:** NYSERDA, in consultation with DEC, New York State Homes and Community Renewal (HCR), New York State Office of Temporary and Disability Assistance (OTDA), and the New York State Division of Homeland Security and Emergency Services (DHSES) should establish a residential and small business resilience audit program.

#### ***AR4. Identify and Evaluate Options for Supporting Equitable Adaptation and Resilience Practices and Projects, and to Enhance Insurance Protection***

The costs of dealing with the effects of climate change will be significant and will continue to rise as the planet warms. These costs may include investments to reduce risk or costs to respond to, and recover from, natural events, exacerbated by climate change. Unfortunately, the benefits of these investments are often difficult to quantify as they generally consist of avoided remedial costs, and the payback is realized only after an event occurs or some dangerous threshold is crossed. Although insurance can serve to spread risk, strategies to enhance insurance coverage must include consideration of renters and owners of at-risk properties who do not participate in the National Flood Insurance Program, and the potential effects of insurance premium increases on low-income households. The components of this strategy are intended to secure the funds necessary to make necessary investments in resilience and enhance insurance protection.

#### **Components of the Strategy**

- **Create a resilient infrastructure fund and prioritize investments in Disadvantaged Communities:** The State should create a resilient infrastructure fund through bonding, such as through the “Clean Air, Clean Water, and Green Jobs” Environmental Bond Act. In developing investment programs, the State should explore creation of equitable methods for benefit-cost analysis and valuing damages and losses.
- **Establish an insurance-premium surcharge for high-value, high-risk properties:** Impose a surcharge on insurance premiums for select lines of insurance to support risk-reduction and adaptation projects.
- **Authorize community preservation funds for all municipalities:** The State should enact legislation authorizing all municipalities to establish community preservation funds.
- **Focus anchor-institution investment on community benefit and wealth building:** New York Department of Health (DOH) should encourage anchor institutions (large, usually nonprofit organization tethered to their communities, like universities, medical centers, or local government entities) to focus community benefit investments on projects to equitably address climate change and build local community wealth.
- **Explore hazard mitigation funding alternatives:** The Division of Budget, or other appropriate agency, should report on options to enhance hazard mitigation funding and to prefund disaster recovery, and to transfer catastrophic risk to the insurance and capital markets.
- **Improve insurance coverage:** DEC and partners at all levels of government should implement strategies to increase take-up rates of flood insurance and other coverage related to climate hazards.



- **Restrict anti-concurrent causation clauses:** The State should adopt legislation to prohibit or restrict anti-concurrent causation clauses for sewer backup insurance coverage where flooding is the cause.

### ***Enhance Community and Infrastructure Resilience***

Enhancing resilience of communities and infrastructure includes strategies to assist municipalities to prepare for and react to increasingly severe climate hazards. The strategies include recommendations to expand State support for regional and local planning, assist municipalities and local communities in their efforts to incorporate future conditions into local planning and regulatory decisions, recommendations to address risks due to flooding and extreme heat, and recommendations to ensure resilience of the energy system. Implementation of all components of these strategies should prioritize use of natural resources and nature-based features to enhance resilience.

### ***AR5. Provide State Agency Planning and Technical Support for Equitable Regional and Local Adaptation and Resilience Plans and Projects***

Local officials have consistently advised that they lack resources, including not only funds, but technical expertise and access to information and decision-support tools to support effective adaptation planning. This strategy would accelerate current efforts to provide guidance, and financial and technical support for community and regional planning and implementation, for mainstreaming of climate change considerations into local planning and regulatory programs and for consideration of local economic resilience under future climate conditions in planning decisions. This strategy would also provide planning for climate-induced migration, both into and within the State.

### **Components of the Strategy**

- **Develop local adaptation capacity:** DEC, DOS, and other agencies should expand programs to support development of local resilience, continuity and adaptive capacity and consideration of climate change in local regulatory and planning programs.
- **Promote local economic resilience:** DOS, Empire State Development (ESD), and other relevant agencies should support development of local economic resilience strategies, climate-adapted economic development, business continuity planning, and local government climate financing and budgeting.
- **Deploy online tools:** DEC and partner agencies, including DOS, NYSERDA, DHSES, and the Office of Information Technology Services, should support deployment of online tools to

facilitate vulnerability assessments, adaptation planning and implementation. As feasible, guidance documents and online tools should be made available in several languages.

- **Support recovery planning:** DOS and DEC should support community-led pre-event, long-term recovery planning. Such planning should include consideration of managed retreat from highly vulnerable areas.
- **Consider relocation and buyouts as alternatives to electrification:** NYSERDA, in consultation with DEC, HCR, and DOS, should analyze relocation and buyout of properties as potential alternatives to electrification of at-risk buildings.
- **Establish post-disaster strike teams:** The CSRO should establish strike teams to equitably assist municipalities with resilient post-disaster recovery.
- **Plan for climate migration:** The State should convene a work group, to include DEC, NYSERDA, DOS, HCR, DHSES, Governor’s Office of Storm Recovery, subject experts from State University of New York (SUNY) or other universities, and refugee resettlement agencies, to develop a strategy to address climate migration, including consideration of differential effects of relocation strategies in Disadvantaged Communities.

#### ***AR6. Evaluate Opportunities to Ensure Equitable Consideration of Future Climate Conditions in Land Use Planning and Environmental Reviews***

Work to mainstream consideration of climate change in environmental reviews is ongoing, but much remains to be done, and local governments require more explicit authority to consider climate change and biodiversity in comprehensive plans.

#### **Components of the Strategy**

- **Provide guidance on assessment of climate risks:** DEC should accelerate ongoing efforts to develop or update guidance for mitigation of climate change risks, avoiding maladaptation in permit and SEQRA reviews, and amend the SEQRA Handbook and workbooks.
- **Facilitate adaptation projects:** DEC should amend the project review process to facilitate approval of climate adaptation projects.
- **Consider climate and biodiversity in comprehensive plans:** The State should enact legislation amending relevant statutes to include consideration of climate mitigation, adaptation and resilience, and biodiversity as potential topics in comprehensive plans.
- **Protect forests and farmland:** The State should require consideration of forest and farmland protection in all comprehensive and other land use plans that it undertakes or funds.

### ***AR7. Develop Policies, Programs, and Decision Support Tools to Reduce Risks Associated with Coastal and Inland Flooding***

Flooding is New York's primary climate hazard, and we can expect both insured and uninsured losses to increase as sea level continues to rise and more frequent extreme precipitation events result in more extensive and deeper floods, including dangerous flash flooding in urban areas not previously considered flood prone. Components of this strategy would provide improved map and other information resources, funding, and regulations to reduce flood risks.

#### **Components of the Strategy**

- **Increase pace of floodplain assessments:** DEC should increase the pace of local floodplain assessments to identify flood hazards.
- **Right-size infrastructure:** DEC should hire a statewide technical assistance coordinator to support municipalities in right-sizing culverts and bridges to reduce flood risk and improve habitat connectivity.
- **Support Community Rating System participation:** DEC and DHSES should provide support and incentives for municipal participation in the Federal Emergency Management Agency's Community Rating System.
- **Strengthen State building code:** DOS should amend State building code to account for sea level rise and enhanced riverine flooding and for potential use of innovative structures, such as amphibious buildings.
- **Develop statewide mapping strategy:** DEC should develop a statewide flood-risk mapping strategy.
- **Digitize dam failure inundation maps:** DEC should digitize dam failure inundation maps and integrate with other geographic resources to improve emergency planning and response as well as explore approaches to use these maps to enhance public information and outreach efforts.
- **Support dam removals:** DEC should support dam removals that reduce flood risk and improve aquatic habitat quality.
- **Enact flood risk disclosure law:** The State should enact an enforceable flood-risk disclosure law, applicable to both purchases and leases of real property.

### ***AR8. Develop Policies and Programs to Reduce Human Risks Associated with New Patterns of Thermal Extremes***

In most years, more Americans die from the effects of extreme heat than from flooding and frequency of extreme heat events is one of the most direct effects of global warming. At the same time, changes in

atmospheric circulation patterns, perhaps precipitated by loss of sea ice, may lead to periods of extreme cold in New York. Components of this strategy include support for cooling centers, heat emergency planning, weatherization, and access to thermal resilience programs for vulnerable populations.

DEC and NYSERDA are currently developing an extreme heat action plan. They have convened the interagency Extreme Heat Action Plan Work Group (EHAPWG), which released the “Interim Recommendations: Preparing for Extreme Heat” report in July 2022.<sup>334</sup> These interim recommendations include development of a heat adaptation plan by January 1, 2024, and of a heat-specific annex to the State’s comprehensive Emergency Management Plan by June 1, 2023. The EHAPWG has initiated these planning processes and anticipates that those plans will include implementation of all components of this strategy.

### **Components of the Strategy**

- **Implement the extreme heat action plan:** DEC and NYSERDA should coordinate with the EHAPWG to ensure the equitable implementation of all provisions of the extreme heat action plan. The EHAPWG should create a mechanism for evaluating implementation progress and tracking extreme heat related health outcomes and regularly update the extreme heat action plan.
- **Consider building cooling requirements:** The State should assess feasibility of adopting codes and standards for residential building cooling.
- **Develop cooling centers and enhance accessibility:** DEC and DOH, in coordination with the EHAPWG, should continue to support development and operation of cooling centers, including assessments to increase accessibility via public transportation.
- **Develop guidance for considering extreme heat risks in planning, zoning and permitting:** The EHAPWG should develop guidance for considering extreme heat risks, the urban heat island effect, and extreme heat inequities in planning, zoning and permitting decisions, including SEQRA analysis and comprehensive plans.
- **Develop regional and local heat emergency plans:** DOH should support development of regional and local heat emergency plans that prioritize the health and stability of vulnerable communities. DHSSES should facilitate incorporation of these heat emergency plans into county and municipal hazard mitigation plans.

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<sup>334</sup> New York State. 2022. *Interim Recommendations: Preparing for Extreme Heat*. Albany, NY. 48pp. Accessed October 24, 2022, at [https://www.dec.ny.gov/docs/administration\\_pdf/ehapinterimrecommendationsreport.pdf](https://www.dec.ny.gov/docs/administration_pdf/ehapinterimrecommendationsreport.pdf).

- **Strengthen weatherization requirements:** DOS should amend the State building code to require more effective weatherization from thermal extremes.
- **Enhance thermal resilience in vulnerable populations:** OTDA and NYSERDA should promote and facilitate access to programs that provide cooling, weatherization, and solar assistance to vulnerable populations.
- **Develop and implement a comprehensive outreach and communications strategy to reduce risks of extreme heat:** DOH, in coordination with the EHAPWG, should develop a comprehensive strategy for internal and external communications that reduce extreme heat risks, including assessing adequacy of, and addressing deficiencies in, current advisories, agency/authority internal communications, and other internal and external outreach and public education initiatives.
- **Adopt a green infrastructure plan:** DEC and other relevant agencies should develop a strategy to promote and incentivize use of green infrastructure and natural resources, including urban forests, to reduce climate risks. In support of this planning, DEC will identify locations of urban heat islands in Disadvantaged Communities.

### ***AR9. Ensure the Reliability, Resilience, and Safety of the Energy System***

The increasing frequency of severe climatic events has exposed vulnerabilities in the State’s energy system and the need to improve the reliability and resilience of the energy system, as well as the resilience of those who depend on that energy system in buildings and for transportation. Assessment of system vulnerabilities to increasing climate hazards and investment to ensure system resilience will be required. Energy system providers must continually reassess infrastructure vulnerabilities across the entirety of their service territories to determine appropriate resilience initiatives to mitigate potential disruptions due to the effects of climate change and make their infrastructure more adaptable to weather extremes.

#### **Components of the Strategy**

- **Periodically revise existing energy system resilience standards and assess vulnerabilities:** In February 2022, New York enacted legislation requiring utility corporations subject to Public Service Law § 25-a, combined gas and electric corporations, to complete vulnerability assessments to evaluate each electric corporation's infrastructure, design specifications, and procedures and to submit to the New York State Public Service Commission (PSC) climate vulnerability and resiliency plans. The PSC should require regulated utilities and operators of critical infrastructure to incorporate updated climate change projections into required

vulnerability assessments as the assessments are updated and should periodically review established resilience standards and vulnerabilities to climate hazards to ensure their incorporation into PSC-approved risk-reduction plans. Municipal utilities, cooperative utilities, Long Island Power Authority (LIPA), New York Power Authority (NYPA), and other utilities not regulated by the PSC should be supported in the development of their own requirements and plans.

- **Develop strategies for grid outages and extreme weather events:** The CSRO or other designated individual should convene a work group, comprising New York State Department of Public Service (DPS), DHSES, New York State Department of Transportation (DOT), DEC, NYSERDA, NYPA, and other relevant entities, to develop strategies to ensure availability of fuel and power for emergency vehicular fleet operations and essential public transportation during power grid outages. This work group should also establish a resilience plan for EV-charging infrastructure to ensure access to transportation, including evacuation during extreme weather events. Strategies should also consider values of solar-plus-storage and vehicle-to-grid systems.
- **Promote capital improvements:** NYSERDA, in consultation with DPS, DOS, and other relevant entities, should promote capital improvements in buildings to endure grid failures and to facilitate buildings' ability to accept power when the system is re-energized.
- **Include photovoltaic (PV) and electric vehicle (EV) charging in building code:** DOS, in consultation with NYSERDA, should include requirements for PV and EV charging readiness in the building code.
- **Support local renewable and storage systems:** NYSERDA, in consultation with DPS, DHSES, and local governments, should develop a comprehensive strategy to support development of islandable microgrids and district systems using renewable sources of energy to provide locally generated power and behind-the-meter storage, especially in critical facilities, for use during grid emergencies.

### ***Enhance Resilience of Living Systems***

As used in this document, the term “living systems” refers to the State’s natural ecosystems, its agricultural systems, and its forested lands. Strategies recommended to enhance resilience of living systems include addressing risks to ecosystems and biodiversity, enhancing resilience and adaptation of the agricultural sector, and protecting the ability of forests to serve as carbon sinks.

## **AR10. Develop Policies and Programs to Reduce Risks Threatening Ecosystems and Biodiversity**

The components of this strategy provide for a variety of mechanisms to ensure conservation or protection of the most important pieces of our life-sustaining ecosystems. These initiatives include a focus on intentional planning to identify and protect critical ecosystems and to establish and protect connectivity at several scales, ranging from the landscape scale to enable populations to migrate northward and upward as the climate warms, to project-specific planning to ensure wildlife and aquatic organism connectivity. Several of the components below are reflected in strategies of *Chapter 15. Agriculture and Forestry* and *Chapter 19. Land Use*.

### **Components of the Strategy**

- **Improve local wildlife and aquatic connectivity:** DEC and DOT should improve local wildlife and aquatic connectivity, including through use of standardized environmentally friendly design features, during transportation infrastructure improvement projects, as practicable, and as identified by statewide critical terrestrial and aquatic habitat and conservation planning efforts.
- **Expand conservation easements to include other areas:** DEC and New York State Department of Agriculture and Markets (AGM) should expand development of conservation easement and incentive programs (such as the Source Water Buffer Program) to include areas of farms set aside for conservation of wetlands, stream corridors, riparian buffers, or wildlife corridors.
- **Incorporate BMPs from species management plans:** DEC, ORES, NYSERDA, DOS, and DOT should incorporate best management practices (BMPs) from species management plans into State and federally funded or regulated projects, including renewable energy projects, in or near occupied habitats to reduce and mitigate ecosystem impacts.
- **Amend Real Property Tax Law to incentivize private forest stewardship:** The State should enact legislation to amend Real Property Tax Law to incentivize private forest stewardship for a broader range of goals, including biodiversity, wildlife habitat protection, water resource protection, outdoor recreation, and carbon sequestration.
- **Prioritize biodiversity and carbon sequestration:** DEC should heighten consideration of biodiversity and enhancement of carbon sequestration among the priorities in State forest land planning and adopt guidance for development of unit management plans that includes conservation of biodiversity and increased carbon sequestration as priorities.
- **Expand implementation of the Invasive Species Comprehensive Management Plan:** DEC and AGM should advance biocontrol of forest pests, and expand implementation of relevant parts

of the Invasive Species Comprehensive Management Plan, including two key priorities: advancing prevention and early detection and improving the response to invasive species.

- **Ensure protection of stream buffers:** The State should create a regulatory program to ensure protection of stream buffers to protect and enhance water and habitat quality, reduce flood risk, and prevent soil erosion.

### ***AR11. Enhance Climate Resilience and Adaptive Capacity of Agricultural Sector, while Preparing to Take Advantage of Emerging Opportunities***

Included below are recommendations to improve water and energy efficiency on farms, incorporate other climate-resilient practices into farm operations, and continue research and outreach to help farmers prepare for the effects of a changing climate. However, these recommendations do not address the entire gamut of climate hazards New York growers, agricultural workers, and farm communities face and should not be interpreted as a complete agricultural adaptation plan.

#### **Components of the Strategy**

- **Establish a farm water and energy efficiency program:** AGM and NYSERDA should develop and support a water and energy efficiency realization program to meet agricultural needs related to climate change, including decision-support tools, power upgrades, and strategies to reduce equipment costs.
- **Promote resilient crops:** The State should expand support for research and outreach on climate-resilient crop varieties; technology to provide freeze and frost protection; strategies to address invasive species, pathogens, and pests; and increased use of perennial crops for food and feed.
- **Promote agricultural and watershed-based BMPs:** AGM should assess, develop, and promote agricultural and watershed-based BMPs for flood attenuation, drought mitigation, and water quality protection.

### ***AR12. Preserve and Protect the Ability of Forest Ecosystems to Sequester Carbon***

In recognition of the important role healthy forests play in sequestering carbon, ensuring forests retain their sequestration potential under future conditions should be considered in State acquisition programs. As with agriculture, this strategy does not constitute a complete adaptation plan for our forests. Many recommendations described in Strategy AR10, also address the goal of protecting the ability of our forests to continue to sequester carbon. This strategy complements the strategies described in *Chapter 15. Agriculture and Forestry*, which serve to enhance the ability of our forests to remove carbon dioxide (CO<sub>2</sub>) from the atmosphere and sequester it in healthy trees and forest soils.



## **Component of the Strategy**

- **Consider resilience in land acquisition:** DEC, OPRHP, AGM, and other agencies and authorities should include resilience criteria in State acquisition programs.
- **Provide forest resilience guidance:** DEC should provide guidance on forest and tree climate change vulnerabilities and options for increasing forest resilience, including promotion of more climate resilient tree species, where applicable.