

Land Use and Local Government Advisory Panel

Adaptation and Resilience Recommendations

June 2, 2021



**Climate Action
Council**

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Abbreviations, Acronyms and Initialisms

ACOE	U.S. Army Corps of Engineers	EMC	Environmental Management Council	NYSACC	New York State Association of Conservation Commissions
AEM	Agricultural Environmental Management	EPA	U.S. Environmental Protection Agency	OSI	Open Space Institute
AgNPS	Agricultural Non-point Source	EPF	Environmental Protection Fund	PV	Photovoltaic
AR	Adaptation and Resilience	EQA	Environmental Quality Act	QA	Quality Assurance
BOEM	U.S. Bureau of Ocean Energy Management	ESFPA	Empire State Forest Products Association	REDC	Regional Economic Development Council
CRRA	Community Risk and Resiliency Act	GHG	Greenhouse Gas	SAF	Society of American Foresters
CAC	Conservation Advisory Council	HVAC	Heating, Ventilation and Air-conditioning	SEQRA	New York State Environmental Quality Review Act
CSC	Climate Smart Community	NGO	Nongovernmental Organization	SWCD	Soil and Water Conservation Districts
EJ	Environmental Justice	NMFS	U.S. National Marine Fisheries Service	TBD	To Be Determined
EV	Electric Vehicle	NYFOA	New York Forest Owners Association	TNC	The Nature Conservancy
		NYS	New York State	USFWS	U.S. Fish and Wildlife Service

New York State Agencies and Authorities

AGM	Department of Agriculture and Markets	DPS	Department of Public Service	OITS	Office of Information Technology Services
DASNY	Dormitory Authority of the State of New York	DTF	Department of Taxation and Finance	OPRHP	Office of Parks, Recreation and Historic Preservation
DEC	Department of Environmental Conservation	EFC	Environmental Facilities Corporation	ORES	Office of Renewable Energy Siting
DFS	Department of Financial Services	ESD	Empire State Development	OTDA	Office of Temporary and Disability Assistance
DHSES	Division of Homeland Security and Emergency Services	GOSR	Governor's Office of Storm Recovery	PSC	Public Service Commission
DOB	Division of the Budget	HCR	Division of Homes and Community Renewal	SED	State Education Department
DOH	Department of Health	MTA	Metropolitan Transportation Authority	SUNY	State University of New York
DOL	Department of Labor	NYSERDA	Energy Research and Development Authority	SWCC	Soil and Water Conservation Committee
DOS	Department of State	OAG	Office of the Attorney General		
DOT	Department of Transportation	OGS	Office of General Services		

Adaptation/Resilience Category Definitions

Cost

Low

- <\$25M total cost
- Most resources required for successful implementation are already on hand

Medium

- \$25M - \$100M total cost
- Requires some new resources for successful implementation

High

- >\$100M total cost
- Requires high degree of new resources or is a demonstration project
- Strategies with cost >\$250M should indicate the range of anticipated costs

Ease

Easy

- Strategy has been implemented many times and/or can build on an existing NYS program
- Proven and widely available technology
- Key stakeholders are strong supporters, no strong opponents

Medium

- Strategy is new to New York State but has been successfully implemented in other comparable states/countries
- Proven technology with known results, but still small-scale
- Key stakeholders are neutral, or balanced mix of supporters and opponents

Hard

- Strategy is unproven in comparable settings
- Early-stage technology (e.g., need for pilots to prove feasibility and significant capital to scale up)
- Key stakeholders oppose the strategy

Recommended Adaptation and Resilience Initiatives

Adaptation and Resilience Strategy Summary (1/3)

Initiative #	Description	Action type	Climate risk addressed	Ease	Cost
AR1	Commit to creating, implementing and updating a comprehensive and equitable state climate change adaptation and resilience plan	Planning, funding	Multi-hazard	Easy	\$
AR2	Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies	Regulation, policy, guidance	Multi-hazard	Medium	\$\$
AR3	Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors	Program, funding	Multi-hazard	Easy	\$\$-\$
AR4	Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection	Legislation, regulation, funding, revenue generation, analysis	Multi-hazard	Hard	\$\$\$-\$

Adaptation and Resilience Strategy Summary (2/3)

Initiative #	Description	Action type	Climate risk addressed	Ease	Cost
AR5	Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects	Guidance, technical support, funding	Multi-hazard	Easy	\$\$
AR6	Evaluate opportunities to ensure equitable consideration of future climate conditions in land-use planning and environmental reviews	Legislation, regulation, policy, information resources, guidance	Multi-hazard	Medium	\$\$
AR7	Develop policies and tools, and implement programs to reduce risks associated with coastal and inland flooding	Guidance, mapping, analysis, technical support, funding	Sea-level rise, coastal storms and erosion, fluvial and pluvial flooding, stream erosion	Medium	\$\$ + project costs \$\$\$
AR8	Develop policies and programs to reduce human risks associated with new patterns of thermal extremes	Guidance, technical support, funding	Extreme heat days, heat waves, extreme cold	Easy	\$

Adaptation and Resilience Strategy Summary (3/3)

Initiative #	Description	Action type	Climate risk addressed	Ease	Cost
AR9	Ensure the reliability, resilience and safety of a decarbonized energy system	Regulation, investment	Multi-hazard	Hard	\$\$\$
AR10	Develop policies and programs to reduce risks threatening ecosystems and biodiversity	Legislation, planning, municipal grants, acquisition	Follow-on effect of climate change	Medium	\$ + project costs \$\$\$
AR11	Enhance climate resilience and adaptive capacity of agricultural community, while preparing to take advantage of emerging opportunities	Research, funding, outreach	Multi-hazard	Medium	\$\$
AR12	Preserve and protect the ability of forest ecosystems to sequester carbon	Incentives, outreach, policy	Multi-hazard	Medium	\$\$

Recommended Legislative Actions 1/3

- > Conduct periodic, science-based integrated climate assessments and other research to support necessary regulatory and planning activities to reduce risk and promote resilience and make them publicly available. (AR1)
- > Amend Smart Growth Public Infrastructure Policy Act and similar statutes to require consideration of all relevant climate hazards, not only sea-level rise, storm surge and flooding, and issue implementation guidance. (AR2)
- > Create a resilient infrastructure fund through bonding. (AR4)
- > Adopt legislation to prohibit anti-concurrent causation clauses for sewer backup insurance coverage where flood is the cause. (AR4)
- > Impose a surcharge on insurance premiums for select lines of insurance, affected by climate hazards, to generate revenue to support risk-reduction and adaptation projects. (AR4)

Recommended Legislative Actions 2/3

- > Report on options to create tax exemptions for risk-reduction measures and establish a revolving fund to support regional and local risk-reduction and adaptation projects, including provisions to allow borrowing from the fund to meet local cost shares of risk-reduction projects and to provide capital to private entities. (AR4)
- > Adopt legislation extending community preservation funds statewide, specifying such funds may be used for adaptation and resilience projects within the communities or their drinking water watersheds, or for upstream flood mitigation. (AR4)
- > Amend relevant legislation to include consideration of resilience, climate change mitigation and adaptation, and maintenance of biodiversity as potential topics in comprehensive plans. (AR6)
- > Enhance funding for Land Trust Alliance-administered forest easement program to allow land trusts to protect smaller forest parcels in targeted priority areas. (AR10)
- > Provide resources and assistance to local governments to develop natural resource inventories; land-use, watershed and drinking water source protection plans; and regulations that protect forest blocks, wetlands, Important Bird Areas, wildlife corridors, floodplains, stream corridors, and other important habitats. Make eligibility for certain state programs contingent on biodiversity protection and contributions to other climate action priorities. (AR10)

Recommended Legislative Actions 3/3

- > Ensure regulatory oversight for wetlands and waterbodies that were removed from federal protection under the 2020 promulgated “Navigable Waters Protection Rule” and explore expanded use of Unusual Local Importance designation to restore oversight to a portion of the wetlands that lost protections under the rule. (AR10)
- > Improve and expand regulation of all freshwater, non-tidal wetlands and adjacent areas updating state regulations and developing internal and external guidance. Replace Article 24 wetland maps with updated informational Article 24 wetland maps. (AR10)
- > 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. (AR10)
- > 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. (AR10)
- > Provide incentives for improved private forest management, including afforestation, reforestation, and minimal or no-harvest areas where appropriate, e.g., riparian buffers, urban areas. (AR12)

Building Capacity

Building Capacity

- > Commit to creating, implementing and updating a comprehensive and equitable state climate change adaptation and resilience plan. ([AR1](#))
- > Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies. ([AR2](#))
- > Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors. ([AR3](#))
- > Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection. ([AR4](#))

Adaptation and Resilience Strategy – Initiative AR1: Overview

Description:	Commit to creating, implementing and updating a comprehensive and equitable state climate change adaptation and resilience plan
Action type:	Plan, research
Risk addressed:	Numerous hazards present substantial risks to NYS built and natural systems, human health and economy.
Cost and funding considerations:	Low cost relative to risks and potential to mitigate risks through comprehensive adaptation and resilience planning, and potential to provide more effective and efficient programs. Possible environmental and public health funding sources have been identified for consideration.
Ease:	Easy. Many states have state resilience officers and adaptation plans. Adaptation plan framework already developed. Vulnerability assessments and climate research underway.
Example case studies:	Safeguarding California Plan, Colorado Climate Plan 2018, Maryland sectoral strategies, Massachusetts Hazard Mitigation Plan, North Carolina 2020 Climate Risk Assessment and Resilience Plan, Resilient Rhody

Risks / Barriers to success	Possible mitigants
Requires staff to manage additional planning workload, including analysis, coaching stakeholders to evaluate intermediate outcomes and stakeholder engagement. Several important hazards, e.g., drought, drinking water supply, water quality, are not adequately addressed in current recommendations.	Building staff capacity. Assigning a cross-sectoral group such as adaptation and resilience sub-cabinet to facilitate coordination, dialogue and information exchange.

Adaptation and Resilience Strategy – Initiative AR1: Benefits and impacts

Commit to creating, implementing and updating a comprehensive and equitable state climate change adaptation and resilience plan

Benefits and Impacts	
Disadvantaged communities	Comprehensive planning provides greater opportunity for strategic development, implementation and evaluation of programs and projects intended to address vulnerabilities of disadvantaged communities while avoiding climate gentrification (displacement of low-income households).
Health and other co-benefits	Engagement of cross-sectoral local and state health representatives would maximize health benefits and other co-benefits within the plan.
Businesses and industries	Plan should include programs to improve resilience of businesses and other anchor institutions, particularly those critical to training and employment in disadvantaged communities.
Just transition: businesses and industries, workers	Anchor institutions, businesses, employee-owned businesses, industries and labor unions must be engaged to ensure integration of their perspectives into state plan.
Other	Comprehensive planning would help avoid ad-hoc programming and cross-agency duplication of programs, and promote coordination across sectors, a long-term perspective and sustainability of initiatives.

Adaptation and Resilience Strategy – Initiative AR1: Components for delivery

Commit to creating, implementing and updating a comprehensive and equitable state climate change adaptation and resilience plan

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Appoint a state resilience officer within State Operations to coordinate and direct agency hazard mitigation, adaptation, response, resilience and recovery programs.	Director of State Operations	1 yr	DEC, DHSES and other relevant agencies
Convene an adaptation and resilience sub-cabinet to oversee development and implementation of a comprehensive state climate change adaptation and resilience plan.	Director of State Operations	2 yr	DEC, DHSES and other relevant agencies
Complete and implement state agency and authority vulnerability assessments, develop resilience and adaptation plans. Identify and prioritize state adaptation and resilience projects.	DEC	ongoing - 3 yr	All agencies and authorities
Conduct periodic, science-based integrated climate assessments and other research to support necessary regulatory and planning activities to reduce risk and promote resilience and make them publicly available.	Legislature, NYSERDA	ongoing	DEC, communities

Adaptation and Resilience Strategy – Initiative AR2: Overview

Description:	Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies.
Action type:	Legislation, regulation, policy
Risk addressed:	Multi-hazard
Cost and funding considerations:	Medium costs to state, costs to comply TBD, but likely low relative to potential risks. More explicit design requirements would support applications for federal hazard mitigation and disaster recovery funding.
Ease:	Medium, some agency and other stakeholder resistance likely. Agency and stakeholder coordination necessary.
Example case studies:	NYC resilience guidelines, New Jersey S2670/A2785, Massachusetts’ Applied Economics Clinic assessment

Risks / Barriers to success	Possible mitigants
Substantial investment of staff time to develop and implement necessary guidance and policies. Training re: green infrastructure needed for regulators, design community. State agencies, utilities, generators may object to additional requirements.	Allocate funding and technical expertise for communities to comply with additional regulations. Provide incentives for property owners to build A/R into property management. Streamline permitting processes for projects that meet requirements. Use EPA EJscreen tool and adopted definition of disadvantaged community to identify risk areas and vulnerable populations.

Adaptation and Resilience Strategy – Initiative AR2: Benefits and impacts

Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies

Anticipated Benefits and Impacts

Disadvantaged communities	Deliberate action is required to effectively integrate equity into resilience planning and financing. Strategic and equitable development of green infrastructure could reduce flood risk, reduce energy costs, increase local engagement and empowerment, and increase training and employment opportunities in disadvantaged communities.
Health and co-benefits	Addressing climate-exacerbated impacts of insect-borne diseases with the spread of insects, contaminants in floodwaters, and heat-related health impacts would all reduce public health risks.
Just transition: businesses and industries, workers	Enhanced design guidelines would create demand for skilled design professionals and tradespeople. Expanded green infrastructure programs and other programs to encourage or require resilient construction would drive demand for skilled design professionals and tradespeople. Training programs to meet this demand could be targeted to industries and communities in transition, particularly disadvantaged communities. Entrepreneurship training and small business startup support would increase small business creation in climate adaptation and resilience products and services.
Other	Monitoring and evaluation programs should foster equitable stakeholder engagement, transparency and accountability.

Adaptation and Resilience Strategy – Initiative AR2: Components of the strategy 1/2

Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Adopt actionable, science-based, NYS-focused projections of changes in climate parameters (e.g., NYS Climate Impact Assessment) relevant to state decision making, publicize them and standardize their use across all agencies and regulated entities, and ensure their accessibility.	DEC, NYSERDA	ongoing - 2 yr	Agencies, regulated entities
Promote integrated planning and develop criteria for integrated decision making for capital investments, including water infrastructure.	Director of State Operations	2 yr	Economic development and infrastructure agencies, EFC, municipalities
Adopt guidance on selection of metrics to evaluate equity and justice impacts of state policies and actions.	DEC	2 yr	Agencies, disadvantaged communities, municipalities, EJ advocates
Develop and implement frameworks and strategies to increase and prioritize investment in disadvantaged communities to support a just transition as established by the Climate Justice Working Group and Just Transition Working Group.	DEC	2 yr	DOS, DOT, MTA, DASNY, ESD, municipalities

Adaptation and Resilience Strategy – Initiative AR2: Components of the strategy 2/2

Incorporate equitable adaptation and risk-reduction considerations into relevant state funding and regulatory programs, projects and policies

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Develop and adopt design guidelines for state-funded projects to ensure resilience to climate hazards, particularly sea-level rise, fluvial and pluvial flooding, stormwater runoff, and extreme heat.	DEC	2 yr	OGS, DOS, DOT, MTA, DASNY, ESD, OPRHP, EFC, SWCC, SWCD
Amend Smart Growth Public Infrastructure Policy Act and similar statutes to require consideration of all relevant climate hazards, not only sea-level rise, storm surge and flooding, and issue implementation guidance.	Legislature	2 yr	DEC, DOS and infrastructure agencies
Incentivize use of natural resources and nature-based features to mitigate climate hazards, where applicable, and monitor and evaluate benefits.	DEC	2 yr	DOS, OPRHP, funding agencies
Ensure, through state contract provisions, that design professionals and contractors are trained and qualified to incorporate nature-based solutions and projected storm intensity and frequency in infrastructure projects.	OGS	3 yr	DEC, DOS, infrastructure agencies, licensing bodies
Require all state-funded comprehensive land, water-use, watershed and drinking water source protection planning to assess climate-change vulnerabilities and include strategies to promote resilience and reduce risk, as appropriate.	DEC, DOS	2 yr	Municipalities, regional planners, REDCs

Adaptation and Resilience Strategy – Initiative AR3: Overview

Description:	Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors.
Action type:	Program, funding
Risk addressed:	Multi-hazard
Cost and funding considerations:	Low cost to develop and implement education programs, medium costs to subsidize building improvements
Ease:	Easy, existing home audit, and outreach training programs as models. Amendment of Property Condition Disclosure Act potentially controversial.

Risks / Barriers to success	Possible mitigants
Difficult to engage the public in educational programming.	Connect with existing community-based groups and organizations. Improve messaging to connect with existing norms, values, attitudes, and beliefs.

Adaptation and Resilience Strategy– Initiative AR3: Benefits and impacts

Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors

Benefits and Impacts	
Disadvantaged communities	Would create jobs and provides training for youth from disadvantaged communities. Workforce training could be targeted to areas of low employment, including unemployed youth. Educational materials and messaging must be accessible to all. Strategies to reach underrepresented communities must be in place.
Health and other co-benefits	Enhanced public understanding of risks would allow more informed decisions to reduce risks to health and safety.
Businesses and industries	Outreach can include business and industry assistance for climate change adaptation, identification of new markets, skilled labor and professional placement.
Just transition: businesses and industries, workers	Training and placement could be targeted toward communities and industries in transition.
Other	Outreach and education programs should, where feasible, build on existing, credible campaigns and programs.

Adaptation and Resilience Strategy – Initiative AR3: Components for delivery 1/2

Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Establish campaign to build student and public awareness of climate change effects and solutions, including co-benefits of actions to mitigate and adapt to climate change.	DEC	3 yr	NYSERDA, SED
Establish program to enhance resilience of structures and occupants by training building operations staff, e.g., building superintendents, in disaster preparedness and response.	NYSERDA	2 yr	DEC, DOL, DOS, DHSES, MTA municipalities, building owners
Establish program to provide home and small business resilience audits and resilience refinancing or cash incentives for flood and heat resilience retrofits, including emergency energy storage and other health improvement measures.	NYSERDA	3 yr	DEC, HCR, municipalities, contractors, homeowners
Establish or expand climate action corps to employ and train disadvantaged youth and provide a source of skilled labor for management, protection and restoration of ecosystems and drinking water supply watersheds, and implementation of green infrastructure projects that increase nature-based resilience and natural carbon sequestration.	DEC, OPRHP	2 yr	Youth, local governments and nonprofit organizations

Adaptation and Resilience Strategy – Initiative AR3: Components for delivery 2/2

Strengthen meaningful community engagement and public education, and build adaptive capacity across all sectors

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Establish Climate Smart Community Student Corps to train students to engage with municipalities and community groups to facilitate development and implementation of local climate adaptation plans.	DEC	1 yr	CSC supporting agencies, universities, municipalities

Adaptation and Resilience Strategy – Initiative AR4: Overview

Description:	Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection.
Action type:	Legislation, regulation, program, finance
Risk addressed:	Multi-hazard, climate gentrification
Cost and funding considerations:	\$\$\$ for creation of infrastructure fund, \$ for policy development
Ease:	Hard. Financing and risk-transfer models not well known. Political resistance from developers and others likely.
Example case studies:	Environmental and Energy Study Institute: https://www.eesi.org/briefings/view/050719nfip , NYS Healthy Homes Value-Based Payment Pilot Residential Service Providers, Kaiser Permanente Total Health

Risks / Barriers to success	Possible mitigants
<p>Low-cost insurance incentivizes risky behaviors.</p> <p>Political pressure may inhibit adequate pricing of risk through premiums.</p> <p>Catastrophic risks difficult to insure, and difficulties exacerbated by climate change and numerous market failures.</p> <p>Slowly appearing risks difficult to insure.</p>	<p>Communication that risk-based premiums will reduce perverse incentives and overall costs to taxpayers.</p> <p>Rigorous analysis of potential risks and benefits associated with risk-transfer programs.</p> <p>Communication regarding municipal and societal costs associated with high-risk development.</p>

Adaptation and Resilience Strategy– Initiative AR4: Benefits and impacts

Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection.

Benefits and Impacts

Disadvantaged communities

Adverse events have more severe consequences on disadvantaged communities.

Health and other co-benefits

Hospitals and other anchor institutions have an opportunity to enhance community resilience and public health through investment of community benefit funds.

Businesses and industries

Some components of this initiative would affect insurance and financial industry.

Just transition: businesses and industries, workers

Anchor institutions are well situated to implement projects in partnership with community-based organizations and address barriers to employment.

Other

Practices and projects should promote community wealth building as a means of action among the community, government, non-profits, the private sector, anchor institutions, and other relevant stakeholders that increases quality and quantity of wealth in human, social, natural and economic capital; local ownership and control of wealth, and livelihoods of people in communities, intentionally including those on the economic margins toward the mainstream.

Adaptation and Resilience Strategy – Initiative AR4: Components for delivery 1/2

Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection.

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Create a resilient infrastructure fund through bonding.	Legislature	2 yr	Taxpayers
Impose a surcharge on insurance premiums for select lines of insurance, affected by climate hazards, to generate revenue to support risk-reduction and adaptation projects.	Legislature	2 yr	Municipalities, insurers, policyholders, DFS, DTF
Report on options to create tax exemptions for risk-reduction measures and establish a revolving fund to support regional and local risk-reduction and adaptation projects, including provisions to allow borrowing from the fund to meet local cost shares of risk-reduction projects and to provide capital to private entities.	Legislature	2 yr	DTF
Adopt legislation extending community preservation funds statewide, specifying such funds may be used for adaptation and resilience projects within the communities or their drinking water watersheds, or for upstream flood mitigation.	Legislature	2 yr	Municipalities

Adaptation and Resilience Strategy – Initiative AR4: Components for delivery 2/2

Identify and evaluate options for supporting equitable adaptation and resilience practices and projects, and to enhance insurance protection.

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Develop a comprehensive strategy to encourage investment by anchor institutions, such as hospitals, universities, non-profit institutions, public institutions and others, toward community benefit, to equitably address climate change and local community wealth building.	DOH	TBD	Institutions, municipalities
Report on options to enhance hazard mitigation funding and to prefund disaster recovery, and to transfer catastrophic risk to the insurance and capital markets.	DOB	1 yr	Legislature, DEC, DHSES
Address persistent underinsurance by surveying the amount and types of coverage purchased by homeowners and developing strategies for increasing take-up rates of flood insurance and other coverage.	DEC	2 yr	Homeowners
Adopt legislation to prohibit anti-concurrent causation clauses for sewer backup insurance coverage where flood is the cause.	Legislature	2 yr	DFS, insurers, policyholders

Communities and Infrastructure

Communities and Infrastructure

- > Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects. ([AR5](#))
- > Evaluate opportunities to ensure equitable consideration of future climate conditions in land-use planning and environmental reviews. ([AR6](#))
- > Develop policies, programs, and decision support tools to reduce risks associated with coastal and inland flooding. ([AR7](#))
- > Develop policies and programs to reduce human risks associated with new patterns of thermal extremes. ([AR8](#))
- > Ensure the reliability, resilience and safety of a decarbonized energy system. ([AR9](#))

Adaptation and Resilience Strategy – Initiative AR5: Overview

Description:	Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects.
Action type:	Programmatic, funding
Risk addressed:	Multi-hazard
Cost and funding considerations:	Medium (can be completed incrementally)
Ease:	Easy. Many state support programs for regional and local adaptation already in place. Additional tools and programs available to promote and support, or as models. High local demand for support.
Example case studies:	NY Climate Science Clearinghouse Climate Smart Communities Portal, HREP’s Climate Resilience Partnership, PUSH Blue, Climate Safe Neighborhoods, Massachusetts Municipal Vulnerability Preparedness Program
Risks / Barriers to success	Possible mitigants
Requires high-speed internet access and updated computers and software. Communities and other organizations have limited staff and other resources. Time pressures to implement strategies before the worst impacts of climate change unfold.	Increasing access to broadband. Climate Leadership Coordinators to supplement staff. Citizen volunteer committees to supplement local government staff. Immediate and aggressive action to develop and implement these strategies and recruit adequate personnel will mitigate time pressures.

Adaptation and Resilience Strategy – Initiative AR5: Benefits and impacts

Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects

Benefits and Impacts	
Disadvantaged communities	Would directly engage organizations, businesses, schools and neighborhood groups in disadvantaged communities and provide tools and resources. Potential negative impact of green gentrification.
Health and other co-benefits	Reduction of climate risks results in direct health and safety benefits. Increases health of ecosystems including water resources, increases public engagement, provides employment, and strengthens capacity of local governments.
Businesses and industries	Increases economic resilience, develops business continuity strategies, fosters resilient economic development and fosters climate adaptation-related business opportunities.
Just transition: businesses and industries, workers	Provides new local business opportunities and job training in nature-based solutions for adaptation and resilience, ecosystem-based adaptation and related support services. Helps receiving communities prepare for climate migration and the assimilation of large numbers of people relocating to new climate-resilient communities.
Other	Retreat could have effects on residents that remain, community cohesion, tax base, etc.

Adaptation and Resilience strategy – Initiative AR5: Components for delivery 1/3

Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Support development of local government and community-led resilience, continuity and adaptive capacity. Expand role and capacity of local and regional leaders and advisory bodies to include climate change adaptation and resilience planning and implementation.	DEC	3 yr	DOS, local governments, CACs, EMCs, NYSACC, Legislature
Assist local governments to adopt and integrate climate change considerations into local regulatory programs and land-use plans, including hazard mitigation, local waterfront revitalization, comprehensive land-use, watershed management and drinking water source protection plans.	DEC, DOS, DHSES	ongoing - 2 yr	All state agencies, local governments
Develop local economic resilience strategies and provide support to local governments and businesses with climate-adapted economic development, business continuity planning, and local government climate financing and budgeting.	TBD	3 yr	DOS, DEC, local governments, Legislature
Continue and expand the Climate Leadership Coordinators program to provide training, technical support and county and regional capacity building to assist local governments to assess climate vulnerabilities, and to develop and implement adaptation plans.	DEC	ongoing	Local governments, contractors, Legislature

Adaptation and Resilience strategy – Initiative AR5: Components for delivery 2/3

Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Support deployment of online tools to facilitate local and regional vulnerability assessments, adaptation planning and implementation with metrics, project management, progress monitoring dashboard, peer collaboration network, and financing resources.	DEC	ongoing - 2 yr	DOS, OITS, consultant/contractor, local governments
Develop policies and guidance, and provide funding for enhancement of community environmental and economic resilience through pre-event, long-term recovery planning, potentially including managed retreat, with strategic property buy-outs, strategic reuse of industrialized waterfronts, and economic repurposing of buy-out properties and stranded coastal assets.	DOS	3 yr	ESD, DEC, DHSES, HCR, GOSR, FEMA, local governments, Legislature

Adaptation and Resilience strategy – Initiative AR5: Components for delivery 3/3

Provide state agency planning and technical support for equitable regional and local adaptation and resilience plans and projects

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Analyze managed retreat and buyout of properties as potential alternatives prior to electrification of buildings in extreme risk and repetitive loss areas.	NYSERDA	2 yr	DEC, HCR, DOS, municipalities
Establish strike teams to equitably assist municipalities with resilient post-disaster recovery.	TBD	2 yr	DHSES, DOS, DEC, GOSR, municipalities
Evaluate effect of climate migration on NYS and develop a strategy to address it.	DEC	3 yr	NYSERDA, DOS, HCR, DHSES, GOSR, local governments, schools, Legislature

Adaptation and Resilience Strategy – Initiative AR6: Overview

Description:	Evaluate opportunities to ensure equitable consideration of future climate conditions in land-use planning and environmental reviews.
Action type:	Legislation, policy, guidance
Risk addressed:	Multi-hazard
Cost and funding considerations:	Medium cost to evaluate opportunities and implement necessary regulatory and policy changes. Staff or consultants needed to develop information sources, e.g., maps, and guidance.
Ease:	Medium. Challenges include staff availability; stakeholder resistance, particularly development community; complexities of assessing cumulative impacts; resistance to regional planning
Example case studies:	California EQA Guidelines, Washington State Environmental Policy Act, Council on Environmental Quality guidance,

Risks / Barriers to success	Possible mitigants
<p>Municipalities, developers and other businesses may object to additional review requirements.</p> <p>Limited capacity of local review boards.</p> <p>Lack of maps and other information sources necessary to support assessment of future conditions.</p>	<p>Ensure rigorous stakeholder involvement during development of new requirements.</p> <p>Provide clear guidance for review and readily available information sources.</p>

Adaptation and Resilience Strategy– Initiative AR6: Benefits and impacts

Evaluate opportunities to ensure equitable consideration of future climate conditions in land-use planning and environmental reviews.

Benefits and Impacts	
Disadvantaged communities	Consideration of future conditions during project review provides opportunity to evaluate effects on disadvantaged communities and to develop acceptable alternatives or other mitigation. Environmental review guidance must acknowledge that communities and ecosystems most vulnerable to climate change often have underlying societal and ecological impediments to adaptation, such as lack of access to resources.
Health and other co-benefits	Consideration of future conditions during project review provides opportunity to evaluate effects on public health and incorporate risk mitigation into project plans.
Businesses and industries	Some businesses and industries may object to incorporation of climate change considerations into project reviews.
Just transition: businesses and industries, workers	Could create new jobs around the additional regulations (QA officers, additional code officers).

Adaptation and Resilience Strategy – Initiative AR6: Components for delivery

Evaluate opportunities to ensure equitable consideration of future climate conditions in land-use planning and environmental reviews.

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Develop or update guidance on consideration and mitigation of climate change risks in permit and SEQRA reviews, and amend SEQRA Handbook and workbooks.	DEC	3 yr	Municipalities, regulated community
Amend the project review process to facilitate approval of adaptive projects, including a review incentive program for carbon-neutral or resilient development.	DEC	3 yr	Municipalities, EJ advocates
Amend relevant legislation to include consideration of resilience, climate change mitigation and adaptation, and maintenance of biodiversity as potential topics in comprehensive plans.	Legislature	2 yr	DOS, DEC, municipalities, regional planning bodies

Adaptation and Resilience Strategy – Initiative AR7: Overview

Description:	Develop policies, programs, and decision support tools to reduce risks associated with coastal and inland flooding.	
Action type:	Guidance, mapping, analysis, technical support, funding	
Risk addressed:	Sea-level rise, coastal storms and erosion, fluvial and pluvial flooding, stream erosion	
Cost and funding considerations:	Low cost for development of policies and programs. Medium costs for floodplain assessment, mapping and other information resource development. Potentially high costs for buy-outs, land acquisition and other projects.	
Ease:	Medium. Challenges include staff availability; stakeholder resistance, particularly development community	
Example case studies:	Lake Ontario REDI, Resilient NY studies, Hudson River Flooding Decision Support System mapping tool, Climate-adaptive Design program, Flood Resilience Network, North Carolina Action Plan for Nature-Based Stormwater Strategies, Massachusetts Flood Risk Protection Program	
Risks / Barriers to success	Possible mitigants	
Updates to flood maps not routinely done and do not reflect risks associated with climate change. Decision support tools is needed. Buy-outs and other risk-mitigation measures could promote green gentrification.	Develop more user-friendly tools. Calibrate models with observed events to show how they effectively predict impacts. Improve forecasting and prediction science. Incorporate strategies to avoid green gentrification.	

Adaptation and Resilience Strategy – Initiative AR7: Benefits and impacts

Develop policies and programs to reduce risks associated with coastal and inland flooding

Benefits and Impacts	
Disadvantaged communities	Prioritize allocation of flood hazard mitigation funds to disadvantaged communities and low-income households. More user-friendly tools would help these communities better understand risks. Assess potential negative impact of green gentrification.
Health and other co-benefits	Additional tools and planning would reduce stress and improve preparedness. Health benefits of flood hazard mitigation – reduced exposure to toxic mold, respiratory disease, and other adverse health impacts; avoided losses to lives, livelihoods, and property.
Businesses and industries	Decision-support tools could be used to improve property management and reduce risks to continuing operations.
Just transition: businesses and industries, workers	Federal, state and community investments to build more resilient infrastructure could create additional jobs.
Other	Lack of flood-risk information results in overpayment for housing.

Adaptation and Resilience Strategy – Initiative AR7: Components for delivery (1/2)

Develop policies and programs to reduce risks associated with coastal and inland flooding

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Increase the pace of local floodplain assessments to identify flood hazards.	DEC	ongoing	Municipalities, DOT
Provide support to municipalities for right-sizing culverts and bridges and for dam assessment and removal to reduce flood risk and improve aquatic habitat quality.	DEC	ongoing	DOT, DOS, AGM, SWCD
Provide support and incentives for municipal participation in FEMA’s Community Rating System.	DEC	ongoing	DHSES, DOS
Provide support for incorporation of CRRRA guidelines into local floodplain regulations.	DEC	ongoing	DOS
Amend state building code to account for sea-level rise and enhanced riverine flooding, and potential use of innovative structures, e.g., amphibious buildings.	DOS	TBD	DEC
Develop statewide flood-risk mapping strategy to include an assessment of changes in riverine flood risk, flood map inventory, and a floodplain designation scalability assessment.	DEC	3 yr	DOS, DOT

Adaptation and Resilience Strategy – Initiative AR7: Components for delivery (2/2)

Develop policies and programs to reduce risks associated with coastal and inland flooding

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Explore use of multi-hazard, climate-informed datasets on flood hazard to account for pluvial flood risk, combination flooding due to sea-level rise coupled with extreme precipitation, and other climate effects.	DEC	2 yr	DOT
Digitize current and, as necessary, update out-of-date dam failure inundation maps in digital format and integrate with other geographic resources to improve emergency planning and response, and explore approaches to use these maps to enhance public information and outreach efforts.	DEC	2 yr	Dam owners, municipalities, planning boards, emergency responders, landowners
Support restoration of buy-out areas to maximize flood protection, carbon sequestration and other ecosystem benefits.	DEC	2 yr	HCR, DHSES, DOS, GOSR, OPRHP, NGOs, municipalities

Adaptation and Resilience Strategy – Initiative AR8: Overview

Description:	Develop policies and programs to reduce human health risks associated with new patterns of thermal extremes.
Action type:	Guidance, technical support, funding
Risk addressed:	Extreme heat days, heat waves, extreme cold
Cost and funding considerations:	\$
Ease:	Easy

Risks / Barriers to success	Possible mitigants
Providing air conditioning to vulnerable populations contributes to GHG emissions (albeit a relatively small proportion of the overall).	Use of low-GHG HVAC equipment and heat pumps. Central and accessible cooling centers rather than individual units
Evolving understanding of the health impacts associated with weatherization.	Evaluation of health impacts associated with weatherization.
Staff time and resources.	

Adaptation and Resilience Strategy – Initiative AR8: Benefits and Impacts

Develop policies and programs to reduce human health risks associated with new patterns of thermal extremes

Benefits and Impacts

Disadvantaged communities

Many of the components proposed under this strategy have a focus on vulnerable populations and disadvantaged communities. Strategies to promote use of natural resources and nature-based features must include protection, maintenance and care of existing features near disadvantaged communities.

Health and other co-benefits

Reduced heat-related illnesses (both direct and indirect).

Businesses and industries

Potential benefits to businesses that follow thermal-protection design guidelines.

Just transition: businesses and industries, workers

Opportunity to provide training to workers from disadvantaged communities on certain technologies to mitigate impacts of extreme heat and then hire them for subsequent work. Recommended actions would reduce high-heat risks to workers.

Adaptation and Resilience Strategy – Initiative AR8: Components for delivery 1/2

Develop policies and programs to reduce human health risks associated with new patterns of thermal extremes

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Provide guidance and funding for development of regional and local heat emergency plans that demonstrate a prioritization toward the health and stability of disadvantaged communities.	TBD	TBD	DOH, DEC and other state agencies, local emergency management and other agencies
Promote and facilitate access to programs that provide cooling to vulnerable populations, with focus on providing high-efficiency units, and addressing energy costs/insecurity and additional barriers to use.	TBD	TBD	Local social service, public health, DPS, utilities, OTDA, DOH, NYSERDA
Promote and fund development and implementation of cooling centers, including assessments to increase accessibility via public transportation.	DEC	2 yr	DHSES, DOH, DOT, NYSERDA, transportation providers, local emergency management, and other agencies

Adaptation and Resilience Strategy – Initiative AR8: Components for delivery 2/2

Develop policies and programs to reduce human health risks associated with new patterns of thermal extremes

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Adopt a strategic plan to expand, promote and incentivize use of natural resources, nature-based features, shade structures, cool roofs, cool pavements, parks and spray pads to reduce individual risks and mitigate neighborhood climate impacts associated with extreme heat, with focus on disadvantaged communities.	DEC	2 yr	DOS, NYSERDA, DOH, OPRHP, DOT, municipalities
Develop and maintain heat warning systems to communicate to the public, workers and other stakeholders.	DOH	1 yr	State and local agencies
Develop and update educational materials and messaging related to the risks of exposure to extreme heat/cold for vulnerable populations, workers and other key stakeholders.	DOH	1 yr	State and local agencies
Amend state building code to require more effective weatherization from thermal extremes.	DOS	TBD	DOH, NYSERDA, DEC, HCR, OGS, municipalities
Develop a strategy to enhance and leverage the NYS Weatherization Assistance Program, providing the opportunity to deepen indoor comfort for extreme conditions.	HCR	TBD	OTDA, DOH, NYSERDA, DEC, OGS, municipalities, Legislature
Develop and provide training, assistance, and/or guidance on reduction of thermal risks to local public health staff, code officials and other partners.	DOH	1 yr	DEC, DOS, municipalities

Adaptation and Resilience Strategy – Initiative AR9

Overview:

Description:	Ensure the reliability, resilience and safety of a decarbonized energy system.
Action type:	Regulation, policy, funding, analysis, mapping, technical support
Risk addressed:	Multi-hazard, especially sea-level rise, flooding, drought, thermal extremes, extreme storms, wildfire.
Cost and funding considerations:	\$\$\$, substantial investment required to ensure resilience; costs reduced if incorporated into initial siting and design on new infrastructure
Ease:	Hard. Stakeholder and regulator support required to fund investments in resilience. Need to consider company and geographic diversity in risk assessments and establish resilience standards.
Example case studies:	Con Ed resilience plan

Risks / Barriers to success	Possible mitigants
<p>Generation and T&D infrastructure vulnerable to climate hazards that are increasingly severe.</p> <p>High costs to enhance infrastructure resilience.</p> <p>Resistance to continued use of gas infrastructure.</p>	<p>Continued research on climate projections, and siting and design standards that incorporate future conditions.</p> <p>Capital improvements and codes to enhance NYS building stock resilience to grid failures.</p> <p>Analysis to understand risk and resilience costs; financial mechanisms to offset costs and shift risks, technology R&D, education; incorporation of future conditions into initial siting and design.</p> <p>Amend building codes to ensure customer and business resilience.</p>

Adaptation and Resilience Strategy – Initiative AR9: Benefits and impacts

Ensure the reliability, resilience and safety of a decarbonized energy system

Anticipated Benefits and Impacts

Disadvantaged communities

Transition costs will affect everyone, but disadvantaged communities will bear a disproportionately larger share and be among the last to benefit.

Health and co-benefits

Decarbonization will eliminate major sources of air pollution. Significant health and safety risks associated with long-term outages.

Just transition: businesses and industries, workers

New jobs will be created in the emerging clean-energy economy, but these new jobs should provide family sustaining wages for blue color workers. New qualifications and skillsets needed for new technology deployment, maintenance and recovery.

Other

Electrification has many benefits, but vulnerability to grid failure will increase. Investment in new clean generation and construction of T&D infrastructure provides opportunity to achieve resilience through planning, siting, codes and standards.

Adaptation and Resilience Strategy – Initiative AR9: Components of the strategy 1/2

Ensure the reliability, resilience and safety of a decarbonized energy system

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Institute a PSC proceeding to establish resilience standards and require public and investor-owned utilities and generators to assess vulnerabilities to climate hazards, including potential spread of chemical contaminants, and to develop and implement agency-approved risk-reduction plans.	PSC	3 yr	DPS, utilities, generators
Prioritize investments that modernize the energy system to ensure reliability and resilience.	PSC	3 yr	NYSERDA, DPS, utilities, generators
Provide guidance to ensure siting and design of energy assets are resilient to future climate hazards, while recognizing value of other land uses, e.g., forests and agriculture.	NYSERDA	2 yr	ORES, DPS, DEC, DOS, AGM, utilities, generators
Develop strategies to ensure availability of fuel and power for emergency vehicular fleet operations and essential public transportation during power grid outages. Establish a resilience plan for EV-charging infrastructure to ensure access to transportation, including evacuation during extreme weather events.	TBD	2 yr	DPS, DHSES, DOT, DEC, NYSERDA, NYPA, other agencies, local governments

Adaptation and Resilience Strategy – Initiative AR9: Components of the strategy 2/2

Ensure the reliability, resilience and safety of a decarbonized energy system

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Promote capital improvements to buildings to endure grid failures (high-performance building envelopes, batteries, solar PV), and to facilitate buildings' ability to accept power when system re-energized.	NYSERDA	3 yr	PSC, DPS, DOS, utilities, municipalities
Include requirements for PV and EV-charging readiness in building code.	DOS	TBD	NYSERDA, PSC, DPS, utilities, municipalities
Develop a comprehensive strategy to support development of islandable microgrids and district systems using renewable sources of energy to provide locally generated power, especially to critical facilities during grid emergencies.	NYSERDA	2 yr	Local governments, utilities

Living Systems

Living Systems

- > Develop policies and programs to reduce risks threatening ecosystems and biodiversity. ([AR10](#))
- > Enhance climate resilience and adaptive capacity of agricultural community, while preparing to take advantage of emerging opportunities. ([AR11](#))
- > Develop policies and programs to preserve and protect the ability of forest ecosystems to sequester carbon. ([AR12](#))

Adaptation and Resilience Strategy – Initiative AR10: Overview

Description:	Develop policies and programs to reduce risks threatening ecosystems and biodiversity.
Action type:	Legislation, planning, municipal grants, acquisition
Risk addressed:	Loss of biodiversity, loss of critical habitats and threatened and endangered species, and other ecosystem services
Cost and funding considerations:	Low cost to develop plans, develop spatial inventories of natural resources, and provide municipal grants. Medium to high costs for land acquisition.
Ease:	Medium. Challenges include need for legislation, local or developer opposition and federal involvement.
Example case studies:	Aquatic organism passage projects through the State WQIP Municipal Grant Program

Risks / Barriers to success	Possible mitigants
<p>Political opposition to increased regulatory authority.</p> <p>Municipal resistance to state acquisition of lands.</p> <p>Potential effects of climate adaptation and resiliency solutions (e.g., protecting shoreline, raising transportation corridors).</p> <p>Inadequate funding and staffing.</p>	<p>Targeted public education and outreach.</p> <p>Partnerships with NGOs (e.g., TNC, OSI, Scenic Hudson)</p> <p>Interagency communication and coordination to minimize natural resource impacts of projects.</p> <p>Bonded funding.</p>

Adaptation and Resilience strategy– Initiative AR10: Benefits and impacts

Benefits and Impacts	
Disadvantaged communities	Improving wetland function in urban watersheds provides natural areas for enjoyment, recreation, and education. Expanding waterfront public lands to allow for tidal wetland migration provides EJ communities with open space.
Health and other co-benefits	Healthy ecosystems provide services that benefit people: flood mitigation, recreation (e.g., hiking, camping, fishing, hunting, wildlife viewing), carbon sequestration, clean water and air, renewable natural resources (e.g., hunting, fishing, lumber).
Businesses and industries	Benefits include flood mitigation, resilient infrastructure. Impacts: regulatory restrictions in wetlands and adjacent areas.
Just transition: businesses and industries, workers	Replacing undersized and failing road/stream crossings provides construction jobs and resources to municipalities. Reducing flooding reduces flood damage to businesses, industries, and workers' private residences.
Other	Healthy, resilient fish and wildlife resources; open space for all New Yorkers; increased recreational opportunities in urban areas. Development of a conservation framework must include natural areas along the entire rural to urban spectrum.

Adaptation and Resilience Strategy – Initiative AR10: Components for delivery 1/5

Develop policies and programs to reduce risks threatening ecosystems and biodiversity

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Adopt the goals of the New England Governors and Eastern Canadian Premiers Resolution 40-3, Resolution on Ecological Connectivity, Adaptation to Climate Change, and Biodiversity Conservation.	DEC	1 yr	DOS, OPRHP, DOT
Develop statewide conservation framework that incorporates current, accurate spatial data on critical ecosystems (terrestrial and aquatic), including priority ecosystem complexes and habitat connectivity, and provides basis for prioritizing state funding, tax relief, land acquisition, including acquisition of state and national forest inholdings, dam removal, and technical assistance programs to conserve natural areas.	DEC	2 yr	DOS, OPRHP, NGOs
Establish conservation corridors to implement an integrated, watershed approach to improve critical terrestrial and aquatic habitats that fosters connectivity, supports fish and wildlife, protects drinking water quality and provides community resilience to drought and flooding.	DEC	3 yr	DOS, OPRHP, land trusts, SWCD
Improve 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.	DEC, DOT	4 yr	MTA, NGOs
Prioritize protection of large private forest parcels and biodiversity through conservation easements or fee acquisition.	DEC	10 yr	DOS, OPRHP, land trusts

Adaptation and Resilience Strategy – Initiative AR10: Components for delivery 2/5

Develop policies and programs to reduce risks threatening ecosystems and biodiversity

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Expand Land Trust Alliance-administered forest easement program to allow land trusts to protect smaller forest parcels in targeted priority areas.	Legislature	1 yr	DEC, NGOs
Continue development of conservation easement and incentive programs (e.g., Source Water Buffer Program) to include areas of farms set aside for conservation of wetlands, stream corridors, riparian buffers, or wildlife corridors.	AGM, SWCC	2 yr	SWCD, farmers
Provide resources and assistance to local governments to develop natural resource inventories; land-use, watershed and drinking water source protection plans; and regulations that protect forest blocks, wetlands, Important Bird Areas, wildlife corridors, floodplains, stream corridors, and other important habitats. Make eligibility for certain state programs contingent on biodiversity protection and contributions to other climate action priorities.	Legislature	2 yr	DEC, OPRHP, DOS, NGOs, local governments
Ensure regulatory oversight for wetlands and waterbodies that were removed from federal protection under the 2020 promulgated “Navigable Waters Protection Rule” and explore expanded use of Unusual Local Importance designation to restore oversight to a portion of the wetlands that lost protections under the rule.	Legislature, DEC	3 - 5 yr	DOS, ORES, DPS, OAG

Adaptation and Resilience Strategy – Initiative AR10: Components for delivery 3/5

Develop policies and programs to reduce risks threatening ecosystems and biodiversity

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Map and inventory all wetlands (regulated and unregulated, tidal and non-tidal), shallow water habitats, Significant Coastal Habitats, priority forests, and critical fish and wildlife resource connections. Ensure all maps and inventories are accurate and publicly available.	DEC, DOS	3 – 10 yr	ACOE, municipalities, NGOs, ORES
Improve and expand regulation of all freshwater, non-tidal wetlands and adjacent areas updating state regulations and developing internal and external guidance. Replace Article 24 wetland maps with updated informational Article 24 wetland maps.	Legislature, DEC	5 yr	DOS, ORES
Expand the Aquatic Connectivity Restoration category of the State WQIP Municipal Grant Program to incorporate climate risks to aquatic ecosystems in project selection and prioritize culvert/road crossing vulnerabilities for enhanced funding.	DEC	2 yr	DOT, local governments, NGOs, SWCD
Develop regional permits (or specific Nationwide Permit 54 regional conditions) with Army Corps of Engineers to incentivize use of natural and nature-based features to enhance resilience and ecosystem benefits.	DEC	Unknown	DOS, ACOE, DOT

Adaptation and Resilience Strategy – Initiative AR10: Components for delivery 4 of 5

Develop policies and programs to reduce risks threatening ecosystems and biodiversity

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Seek to site major energy infrastructure in a way that avoids or minimizes significant impacts to critical wildlife habitat and drinking water sources. Leverage mitigation funding for renewable energy projects permitted through the Office of Renewable Energy Siting to mitigate effects that cannot be avoided.	DEC	1-30 yr	ORES, DPS, NYSERDA
Incorporate best management practices (e.g., construction windows) from threatened and endangered species management plans into state and federal funded or regulated projects in or near critical habitats (e.g., coastal and tidal wetlands) to reduce and mitigate ecosystem impacts.	DEC, DOS	5 yr	ACOE, USFWS, OPRHP, DOT, OGS, HCR, DHSES, DPS, ORES, NMFS, BOEM
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.	Legislature	3 yr	NYFOA, ESFPA, SAF, NGOs, landowners, DTF, municipalities, SUNY ESF
Increase and heighten consideration of biodiversity and enhancement of carbon sequestration among the priorities in state forest land planning. Adopt guidance for development of unit management plans that includes consideration of biodiversity and increased carbon sequestration as priorities.	DEC	2 yr	Loggers, recreationists, NGOs, SWCDs

Adaptation and Resilience Strategy – Initiative AR10: Components for delivery 5 of 5

Develop policies and programs to reduce risks threatening ecosystems and biodiversity

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Provide technical assistance and incentives to promote use of natural climate solutions and best management practices by landowners, land managers, and agricultural producers.	DEC, AGM, SWCC	2 yr	SCWD
Expand implementation of relevant parts of the NYS Invasive Species Comprehensive Management Plan, including two key ISCMP Priorities: 5) Advance Prevention and Early Detection 6) Improve the Response to Invasive Species. Advance biocontrol of forest pests.	DEC	2 yr	AGM, OPRHP, Cornell University, SUNY ESF, Forest Ecosystem Monitoring Cooperative
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.	Legislature	3 yr	DEC, DOT, landowners, farmers, anglers, SWCC, AGM, SWCD

Adaptation and Resilience Strategy – Initiative AR11

Overview

Description:	Enhance climate resilience and adaptive capacity of the agricultural community, while preparing to take advantage of emerging opportunities	
Action type:	Research, funding, outreach	
Risk addressed:	Multi-hazard, particularly flooding, thermal extremes, drought, seasonal shifts	
Cost and funding considerations:	\$\$, funding from EPF through Climate Resilient Farming, AEM Base Program, AgNPS Program (water quality), and other state and federal programs, seek new and enhanced funding sources.	
Ease:	Easy - program infrastructure exists for many projects/items; Medium for more advanced and novel approaches	
Example case studies:	Agricultural Community Recovery Fund Assessments, Climate Resilient Farming Program	
Risks / Barriers to success	Possible mitigants	
<p>Increased potential for drought and flooding</p> <p>Increased severity of flood damage</p> <p>Pest, weed, and disease pressure</p> <p>Soil degradation including erosion, compaction, and net loss of organic material</p> <p>Insufficient technical and financial resources</p> <p>Climate variability, extremity, and pace of future change</p> <p>The potential for certain adaptation measures to increase GHG emissions (such as barn cooling, irrigation, and frost mitigation equipment)</p>	<p>Greater implementation of conservation practices provides tangible benefits. Technical assistance and protective measures taken at the farm scale will provide planning and physical infrastructure needed to be resilient in face of regional or localized events. Many conservation practices that protect topsoil and attenuate flooding can also be used to store water during times of drought. Many of these practices protect and provide important co-benefits such soil health, water quality, biodiversity and carbon sequestration.</p> <p>Associated public outreach and education to raise public awareness of the threat facing NY agriculture and the landscape at large.</p>	

Adaptation and Resilience Strategy – Initiative AR11

Benefits and impacts

Enhance climate resilience and adaptive capacity of the agricultural community, while preparing to take advantage of emerging opportunities

Anticipated Benefits and Impacts

Disadvantaged communities

Communities, particularly disadvantaged communities, will benefit by increasing job opportunities in soil and water conservation, internships for academic credit as a workforce is expanded that is adequate to meet the scale of local impacts. Benefits of flood attenuation on vulnerable farms come in the form of fewer and less intense impacts/destruction to public, commercial private property and adding to the resilience and ability of farms to survive and build back to be more resilient to climate change.

Health and co-benefits

Farm and watershed scale flood and drought attenuation benefits all by helping maintain a safe food supply by protecting farms, farmland and the necessary public infrastructure. Implementation of conservation practices off the farm at a watershed scale protects the local farming community along with public infrastructure and private communities located in that a watershed. Protections extend to public and private investments, infrastructure, natural resource protection and will reduce cost of future flood recovery efforts. Provide needed stability to hydrologic systems such that natural processes complement programmatic goals. Ecological co-benefits to many flood and drought attenuation best management practices include improvements to carbon sequestration, water quality, biodiversity and habitat. Investments in farm level adaptation and resilience measures helps to ensure a stable secure and local food system.

Just transition: businesses and industries, workers

Large scale, locally led, publicly/private funded conservation efforts will provide training, internship and long-term employment for many people in conservation from across the state. This capacity building and the conservation workload generated will also be supportive of other entities and agencies: farming community, local construction entities, engineers, municipalities, academic institutions.

Adaptation and Resilience Strategy – Initiative AR11

Components for delivery

Enhance climate resilience and adaptive capacity of agricultural community, while preparing to take advantage of emerging opportunities

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Expand support for Climate Resilient Farming and Agricultural Environmental Management programs, including efforts to increase adoption of climate-resilient practices.	AGM, SWCC, SWCDs	1 yr	Farmers, DEC, universities, NGOs,
Develop and support a water and energy efficiency realization program to meet needs related to climate change, including decision-support tools, power upgrades and strategies to reduce equipment costs.	AGM, SWCC, CCE, SWCDs	1 yr	Farmers, DEC, universities, NGOs, NYSERDA
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.	AGM, SWCC, Cornell, CCE	ongoing	Farmers, NGOs, SWCDs, NYSERDA, universities
Assess, develop and promote agricultural and watershed-based best management practices for flood attenuation, drought mitigation and water quality protection.	AGM, SWCC, SWCDs	ongoing	Farmers, DEC, NGOs, universities, CCE, DOT

Adaptation and Resilience Strategy – Initiative AR12: Overview

Description:	Preserve and protect the ability of forest ecosystems to sequester carbon.
Action type:	Incentives, policy, outreach
Risk addressed:	Continued health of forested ecosystems, including their ability to sequester carbon, may be threatened by climate change. Regeneration failure may increase due to deer herbivory, drought, extreme weather events, and invasive species; increased soil erosion and compaction may affect soil carbon. Resilient forests (intact, connected, minimally impacted by pests, pathogens, invasive species and deer, of diverse age classes and species) are better able to withstand climate threats.
Cost and funding considerations:	\$ - Policy and outreach, \$\$ - Incentives
Ease:	Medium - Models exist for outreach program, policy and incentives; some stakeholder resistance likely.
Example case studies:	Northern Institute of Applied Climate Science, Tools for Engaging Landowners Effectively

Risks / Barriers to success	Possible mitigants
<ul style="list-style-type: none"> Cost to private landowners in time and money Landowner interest to participate varies Workforce gaps in private and public sectors Unpredictability of current and future forest health threats Landowner knowledge of public and private programs 	<ul style="list-style-type: none"> Diverse, private wood markets Building forest resilience measures into all efforts and programs Widespread landowner outreach

Adaptation and Resilience Strategy – Initiative AR12: Benefits and impacts

Preserve and protect the ability of forest ecosystems to sequester carbon

Benefits and Impacts	
Disadvantaged communities	Improvements in forest resilience and habitat diversity have a positive effect on disadvantaged communities. Strategy would benefit rural economically disadvantaged communities, including those in EJ areas, by improving the forest-based economy and increasing job opportunities in afforestation and reforestation.
Health and other co-benefits	Opportunity to achieve co-benefits like flood mitigation, biodiversity conservation, clean air, clean water, reduced sediment and nutrient runoff, reduced energy use, and shade.
Businesses and industries	Expand opportunities by increasing the demand for forestry services, including natural resources professionals, certified herbicide applicators, forestry equipment operators, and mill operators. Ancillary benefits of forest recreation and forest-based recreation businesses.
Just transition: businesses and industries, workers	Afforestation can target retired power plants, disadvantaged communities, and other sites.
Other	This strategy will be supported by the Agriculture and Forestry Advisory Panel’s recommendations on avoided forest conversion, improved forest management, and afforestation/reforestation.

Adaptation and Resilience Strategy – Initiative AR12: Components for delivery

Preserve and protect the ability of forest ecosystems to sequester carbon

Components required for delivery <i>(Brief description of action required)</i>	Lead	Time to implement	Other key stakeholders
Provide incentives for improved private forest management, including afforestation, reforestation, and minimal or no-harvest areas where appropriate, e.g., riparian buffers, urban areas.	Legislature	2 yr	DEC, foresters, landowners, ESFPA, NYFOA, municipalities, SWCDs
Develop and promote best management practices to maintain or improve soil health and water quality and reduce harmful harvest and management effects, including under projected climate conditions.	DEC	ongoing	Foresters, landowners, land trusts, loggers, NGOs, SUNY ESF, SWCDs
Develop recommendations for creating and maintaining resilient forests, including recommendations to address herbivory, pests and invasive species, and recreational overuse, and incorporate them into management of NYS lands, and in outreach programs to private and industrial forest landowners.	DEC	ongoing	SUNY ESF, foresters, landowners, loggers, NGOs, ESFPA, NYFOA, SWCDs
Include resiliency criteria in state acquisition programs.	DEC, ORPHP, AGM	ongoing	Land trusts, municipalities, SWCDs