



## APPENDIX I. MITIGATION CATALOG

This appendix includes the mitigation catalog that provided guidance to the county and its jurisdictions in developing mitigation actions.

## Broome County 2019 Hazard Mitigation Plan Update

### Catalog of Risk Reduction Measures

Risk is defined as being a function of the:

- Hazard
- Exposure
- Vulnerability, and
- Capability

Therefore risk can be reduced through mitigation by manipulating the hazard, reducing exposure to the hazard, reducing the vulnerability and/or increasing capability. And, where mitigation is not yet possible, the risk can be reduced through preparation, response or/and recovery. *The list is not meant to be exhaustive, but to inspire thought.*

Catalog of Risk Reduction Measures	Hazard Category			
	Drought			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal Scale	None	1. Consider stored water/captured water techniques during dry seasons. 2. Establishing an irrigation time/scheduling program or process so that all agricultural land gets the required amount of water. Through incremental timing, each area is irrigated at different times so that all water is not consumed at the same time. Spacing usage may also help with recharge of groundwater.	1. Drought resistant landscapes	1. Practice active water conservation techniques.
			2. Reduce Water system losses	2. Seek ways to operate wells in such a way to enhance their functional longevity and supply capability.
			3. Regularly check for leaks to minimize water supply losses	
			4. Install low-flow water saving showerheads and toilets	
			5. Turn water flow off while brushing teeth or during other cleaning activities	
			6. Adjust sprinklers to water the lawn and not the sidewalk or street.	
			7. Run the dishwasher and washing machine only when they are full.	
			8. Check for leaks in plumping or dripping faucets.	
			9. Install rain-capturing devices for irrigation.	
			10. Install graywater systems in homes to encourage water reuse.	
			11. Rotate crops by growing a series of different types of crops on the same fields every season to reduce soil erosion.	
			12. Planting "cover crops," such as oats, wheat, and buckwheat, to prevent soil erosion.	
Corporate Scale	None	1. Consider stored water/captured water techniques during dry seasons.	1. Drought resistant landscapes	1. Practice active water conservation
			2. reduce private water system losses	2. develop a water conservation plan.
			3. identify alternate water supply sources.	3. develop a COOP
			4. Install low-flow water saving showerheads and toilets	
			5. Adjust sprinklers to water the lawn and not the sidewalk or street.	
Government Scale	1. Ground Water Recharge through stormwater management 2. implement cloud seeding techniques during dry seasons.	1. Identify and create ground water back up sources. 2. Create /identify new impounded water supply points. 3. Developing new or upgrading existing water delivery systems to eliminate breaks and leaks.	1. Water use conflict regulations	1. Public education on drought resistance
			2. Reduce water system losses	2. Identify alternative water supplies for time of drought. Mutual aid agreements with alternative suppliers.
			3. Distribute water saving kits	3. Develop a drought contingency plan
			4. Identify sites ideally suited for ground water recharge.	4. Develop criteria-"triggers" for drought related actions
			5. Implement stormwater retention in regions ideally suited for groundwater recharges.	5. Improve accuracy of water supply forecasts
			6. utilize drought resistant landscapes on community owned facilities.	6. Provide incentives to influence active water conservation techniques such as water user rate reductions.
			7. Encourage citizens to take water-saving measures	7. Establish protocol for salt water de-salinization to be implemented during conditions of severe drought.
				8. Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their homes.
				9. Use of Water buffalo Tankers
				10. Promote well usage techniques that strive to enhance functional longevity and supply capability of private water supply wells.
				11. Develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc.

Earthquake

Risk Reduction Measures	Hazard Category			
	Earthquake			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal scale	None	<ol style="list-style-type: none"> <li>1. Locate outside of hazard area (off soft soils)</li> <li>2. Anchoring rooftop-mounted equipment (i.e., HVAC units, satellite dishes, etc.)</li> <li>3. Constructing masonry chimneys greater than 6 ft</li> </ol>	<ol style="list-style-type: none"> <li>1. Retrofit structure (anchor house structure to foundation)</li> <li>2. Secure household items that can cause injury or damage such as water heaters, bookcases, and other appliances</li> <li>3. Build to higher design</li> <li>4. Installing window film to prevent injuries from shattered glass.</li> </ol>	<ol style="list-style-type: none"> <li>1. Practice "drop, cover and hold"</li> <li>2. Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72 hr. self-sufficiency during an event</li> <li>3. Increase capability by having cash reserves for reconstruction</li> <li>4. become informed on the hazard and risk reduction alternatives available.</li> <li>5. develop a post-disaster action plan for your household.</li> </ol>
Corporate scale	None	<ol style="list-style-type: none"> <li>1. Locate/relocate mission critical functions outside hazard area where possible.</li> <li>2. Anchoring rooftop-mounted equipment (i.e., HVAC units, satellite dishes, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Build redundancy for critical functions/facilities</li> <li>2. Retrofit critical buildings/areas housing mission critical functions.</li> <li>3. Anchor or stabilize utility equipment (electrical transformers and generators) to withstand earthquake forces and movements. Examples: anchor electrical transformers; combine equipment on one foundation</li> <li>4. Reinforce, restrain, or improve utility transmission lines and connections to withstand earthquake forces, soil movements and differential settlements. Examples: install expansion joints; reinforce well shaft or install submersible pump; restrain pipes; improve pipe materials.</li> <li>5. Anchor or improve vertical/elevated tank structures or stand pipes to withstand earthquake forces and movements.</li> <li>6. Anchor critical equipment (e.g., computers) and shelving in offices, warehouses, and maintenance buildings in conjunction with building structural upgrades.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adopt higher standard for new construction -- Consider "performance based design" when building new structures</li> <li>2. Increase capability by having cash reserves for reconstruction</li> <li>3. Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility.</li> <li>4. Develop and adopt a Continuity of Operations Plan (COOP)</li> </ol>
		<ol style="list-style-type: none"> <li>1. Locate critical facilities or functions outside of hazard area where possible.</li> <li>2. Anchoring rooftop-mounted equipment (i.e., HVAC units, satellite dishes, etc.)</li> </ol>	<ol style="list-style-type: none"> <li>1. Harden infrastructure</li> <li>2. Provide redundancy for critical functions</li> <li>3. Higher regulatory standards for structures</li> <li>4. Enforce the seismic design provisions in the International Building Code for all new buildings and infrastructure.</li> <li>5. Anchor critical equipment (e.g., computers) and shelving in offices, warehouses, and maintenance buildings in conjunction with building structural upgrades.</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide better hazard maps</li> <li>2. Provide technical information and guidance</li> <li>3. Enact tools to help manage development in hazard areas: tax incentives, information</li> <li>4. Include retrofitting/replacement of critical system elements in CIP</li> <li>5. Develop strategy to take advantage of post disaster opportunities</li> </ol>

Earthquake

Risk Reduction Measures	Hazard Category			
	Earthquake			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Government	None		6. Identify critical facilities constructed of un-reinforced masonry using local knowledge and/or pictometry/orthophotos. These facilities may not be functional during response/recovery efforts after an earthquake and alternative resources/assets should be identified in emergency response/recovery plans.	6. Warehouse critical infrastructure components such as pipe, power line, and road repair material.
			7. Identify privately owned structures/residences constructed of un-reinforced masonry using local knowledge and/or pictometry/orthophotos. These buildings may not withstand earthquakes of certain magnitudes and plans to provide emergency response/recovery efforts for these properties should be in place.	7. Develop and adopt a Continuity of Operations Plan (COOP)
				8. Initiate triggers guiding improvements such as: (< 50% substantial damage/improvements)
				9. Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities.
				10. Develop a post disaster action plan that includes a grant funding and debris removal components.
				11. Educate builders and developers on seismic construction standards
				12. Add earthquakes to emergency response plans for training and drills for employees.
				13. Increase public awareness of potential earthquake hazards
				14. Enhance public education and outreach efforts to increase awareness of earthquake hazards and risks in the County.
				15. Enhance emergency preparedness/response capabilities by training building officials, engineers, architects, building owners, emergency managers, and/or interested citizens the Rapid Visual Screening (RVS) methodology outlined by FEMA in the Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook. Second Edition. RVS is used to identify, inventory and rank buildings posing risk of death, injury, or severe curtailment in use following an earthquake.
	16. Prepare vulnerability study of masonry buildings.			
	17. Train inspectors on post-disaster visual evaluation.			
	18. Train building code officials on seismic standards/ design provisions in the International Building Code.			

Extreme Temperatures

Catalog of Risk Reduction Measures	Hazard Category			
	Extreme Temperatures			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal Scale	None	1. Vacation in Cooler climates during summer months.	1. Air Condition non-conditioned buildings.  2. Install back-up wood burning stoves	1. Be aware of impending heat waves.
		2. Insulate house		2. Inform yourself on the do's and don't's during heat waves.
		3. Provide redundant power.		3. Have fans available for use during peak demands in lieu of air conditioning.
		4. Insulate structure		4. Install back-up generators
		5. Plant appropriate trees near home ("Right tree, right place" National Arbor Day Foundation Program).		
Corporate Scale	None	1. Create redundancy to power supply to deal with power grid vulnerability during high demands	1. Air Condition non-conditioned buildings.	1. Inform employees of the seriousness of heat waves.
				2. Monitor weather forecasts.
				3. Establish an COOP.
Government Scale	None	1. Create redundancy to power supply to deal with power grid vulnerability during high demands	1. Air condition public buildings.	1. Inform the public on the seriousness of heat-waves.
				2. Identify populations vulnerable to extreme heat (elderly, poor) for early warning during potential heat waves.
				3. Enhance weather forecasting capability
				4. Distribute fans to vulnerable populations.
				5. Promote selective approaches to cooling buildings during peak demands.
				6. Water Supply Mapping Initiative

Flooding

Risk Reduction Measures	Hazard Category			
	Flooding			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal scale	1. Clear stormwater drains and culverts	1. Locate outside of hazard area	1. Retrofit structure (Elevate structure above BFE)	1. Enforce NFIP
	2. Install local stormwater capture systems	2. Elevate utilities above BFE	2. Elevate items with house above BFE	2. Buy flood insurance
		3. Institute low impact development techniques on property	3. Build new homes above BFE	3. Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72 hr. self-sufficiency during and after an event
		4. Assess projects to determine if they may inadvertently increase flood risk	4. Flood proof existing structures.	4. Be aware of evacuation routes
		5. Use of permeable driveways and surfaces to reduce runoff and increase groundwater recharge		5. Education yourself on flood risk from related hazards, such as wildfire
		6. Raise utilities or other mechanical devices above expected flood levels		6. Participate in CERT training
Corporate scale	1. Clear stormwater drains and culverts	1. Locate business critical facilities or functions outside hazard area	1. Build redundancy for critical functions/ retrofit critical buildings.	1. Increase capability by having cash reserves for reconstruction
	2. Install local stormwater capture systems	2. Institute low impact development techniques on property	2. Provide flood-proofing measures when new critical infrastructure must be located in floodplains.	2. Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones.
		3. Assess projects to determine if they may inadvertently increase flood risk		3. Solicit "cost-sharing" through partnerships with private sector stake holders on projects with multiple benefits.
		4. Use of porous pavement, vegetative buffers, and islands in large parking areas.		
		5. Raise utilities or other mechanical devices above expected flood levels		
	1. Clear stormwater drains and culverts	1. Locate/re-locate critical facilities outside of hazard area	1. Harden infrastructure	1. Produce better hazard maps
	2. Dredging, levee construction, providing retention areas...	2. Acquire or relocate identified repetitive loss properties.	2. Provide redundancy for critical functions and infrastructure	2. Capture/survey "high-water" marks during flood events.
	3. Structural flood control: levee's, dams, channelization, revetments.	3. Promote open space uses in identified high hazard areas via techniques such as: PUD's, easements, setbacks, greenways, sensitive area tracks.	3. Adopt appropriate regulatory standards such as cumulative substantial improvement/damage, freeboard, lower substantial damage threshold, compensatory storage.	3. Provide technical information and guidance to local municipalities for flood mitigation projects.
	4. Construct regional stormwater control facilities	4. Adopt land development criteria such as PUD's, Density transfers, clustering	4. Stormwater management regulations and master planning.	4. Enact tools to help manage development in hazard areas (stronger controls, tax incentives, information)
		5. Institute low impact development techniques on property	5. Adopt "no-adverse impact" floodplain management policies that strive to not increase the flood risk on down-stream communities.	5. Incorporate retrofitting/replacement of critical system elements in CIP

Flooding

Risk Reduction Measures	Hazard Category			
	Flooding			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Government Scale		6. Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff	6. Participate in the Community Rating System (CRS)	6. Develop strategy to take advantage of post disaster opportunities
		7. Enforce more strict parking standards to ensure vehicles aren't being parked in flood prone areas or bought out properties.	7. Implement as-built regulatory requirements,	7. Warehouse critical infrastructure components
		8. Utilize alternative funding sources for property buyouts that do not have the same restrictions as FEMA buyout programs.	8. Implement site review ordinances/requirements	8. Develop and adopt a COOP
			9. Increase floodplain standards within municipal ordinances, and include provisions for enforcing best practice standards within floodplains and using preliminary flood maps.	9. Join CRS program
			10. Utilize vacant lots for pocket parks, community gardens, non-permanent projects, or for implementing green infrastructure projects.	10. Maintain existing data as well as gather new data needed to define risks and vulnerability.
				11. Train emergency responders
				12. Provide FEMA flood training for code officers and provide incentive for officers to get training.
				13. Be proactive in buy-outs for contiguous open space.
				14. Create a building and elevation inventory of structures in the floodplain
				15. Develop and implement a public information strategy-work on better county-wide joint communications to get out a unified message.
			16. Develop fees for sewerage.	
			17. Charge a Hazard mitigation fee on all new permits to create a hazard mitigation funding source for initiatives or grant cost share requirements.	
			18. Enact new development fees for sewerage.	
			19. Integrate floodplain management policies into other planning mechanisms within the planning area.	



Flooding

Risk Reduction Measures	Hazard Category			
	Flooding			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Government Scale				20. Establish a Stormwater Utility to deal with urban drainage/flooding issues. Implement "impact fees" or "stormwater utilities" to help fund mitigation and maintain stormwater management systems.
				21. Establish incentives to promote flood hazard mitigation of private property.
				22. Develop mitigation partnerships with Stakeholders
				23. Join "Storm Ready" Program
				24. Participate in County Training Programs
				25. Implement annual training to account for high turnover of municipal officials.
				26. Educate public on Flood Hazards
				27. Develop flood response plan.
				28. Prepare inundation maps for use by local emergency personnel
				29. Disseminate evacuation procedures
				30. Develop ACTIONABLE evacuation orders with teeth in them.
				31. Ensure public safety and ambulance drivers know safe evacuation routes.
				31. Improve radio communications.
				33. Install local radio transmitter for local radio information dissemination
				34. Locate EOC and shelters on high ground.
				35. Install rain gage/flood warning system
				36. Gather and input resident cell phone numbers into reverse 911.
			37. Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.	
			38. Produce municipal and county post-disaster manuals to provide efficient recovery procedures and reimbursement of funds.	
			39. Provide flood protection for critical facilities. Mitigate flood risk as the County Office Building complex and Johnson City public works.	

Flooding

Risk Reduction Measures	Hazard Category			
	Flooding			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
				40. Implement safe document archiving systems to preserve important records on municipal, county, and agency levels.
				41. Support the establishment of a silver jacket team in NYS to support the reduction of flood risk in communities.
				42. Develop better education and outreach regarding flood insurance and NFIP programs.
				43. Identify local 25% funding match for grant eligible projects.
				44. Find consistent funding for river gages-support inclusion as a Federal budget line item.
				45. Enact local real estate disclosure regulations for hazard areas. Enhance regulations for risk disclosure.
				46. Leverage excellent flood inundation mapping to support emergency management of flood events (evacuations, road closures, emergency routes, etc.)
				47. Identify other potential funding mechanisms so support mitigation (e.g. a local mitigation "kits" to support grant applications)
				48. Adopt ordinances to require backup power for water and wastewater systems (particularly relevant to developments, trailer parks or industrial facilities)
				49. Flood-proof/harden critical infrastructure (specifically identified was substations, water wells and WWTP such as the Joint Sewerage Commission in Binghamton)
				50. Facilitate an insurance summit and then disseminate the information in a public outreach campaign.
				51. Facilitate and promote an NFIP update workshop with NYSDEC, perhaps as part of the County Flood Tasks Force of the Legislature.
				52. Provide Mitigation outreach campaign for businesses.

Flooding

Risk Reduction Measures	Hazard Category			
	Flooding			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
				53. Promote available mitigation-related training in the area.
				54. Improve integration and coordination amongst vulnerable populations...through County Mental Health.
				55. Pursue flood/stormwater study on regional/watershed level. Continue to petition the Federal Government to include maintenance of River Gages as a budget line item.
				56. Pursue accreditation for floodwalls/levees to ensure structural design meets flood protection standards.
				57. Increase coordination and information sharing between municipalities, both with data and on mitigation/preparedness projects.
				58. Work with insurance agencies and real estate agents to provide workshops on tools and resources to get more information on flood hazard zones and FIRMs.
				59. Work on engaging the public with progress on flood mitigation projects to demonstrate progress is being made.
				60. Engage federal, state, regional, and local stakeholders/resources within the county to create updated flood studies.
				61. Mark boundary of buyout properties (surveyed and marked) to engage inspection and progress reporting to CRS.
				62. Proactive planning for buyouts to ensure more comprehensive buyout programs.
				63. Procure elevation certificates for all insured properties within the county, both Pre and Post FIRM.
				63

Risk Reduction Measures	Hazard Category			
	Invasive Species			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal scale	1. Participate in quarantine, control, or eradication programs.		1. Form citizen action groups to promote awareness and best practices on local levels.	1. Regularly check the NYSISRI Portal for updated information.
				2. Comply with Invasive Species rules and regulations to minimize the chance for invasive species to spread.
				3. Broaden collaborations focused on ecosystem restoration and ecosystem-based management.
Corporate scale	None	None	None	1. Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region.

	1. Work with Federal/State agencies on quarantine, control, or eradication programs for invasive species.	1. Create/disseminate planting guides which explain which types of plants and vegetation are safe to plant within the county.	1. Pass municipal ordinances to enforce best practices for invasive species at the local level.	1. Build and maintain partnerships with other stakeholders to coordinate information sharing, and response for Invasive Species throughout the county/region.
				2. Work with federal/state agencies to disseminate information to local municipalities regarding Invasive Species from the NYS Invasive Species Research Institute portal.
				3. Disseminate information to the general public to educate them on Invasive Species

<b>Government Scale</b>				4. Work with stakeholders to identify and expand resources for prevention and early detection of invasive species.
				5. Support New York State's initiative for an invasive species early warning system.
				6. Broaden collaborations focused on ecosystem restoration and ecosystem-based management.
				7. Build ecological restoration planning into IS management projects.
				8. Support New York State's marketing, branding, and educational initiatives.

Severe Storms

Risk Reduction Measures	Hazard Category			
	Severe Storms			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal Scale	None	1. Use natural environmental features as wind buffers	1. Insulate house	1. Trim or remove trees that could effect power lines
			2. Provide redundant heat and power.	2. Promote 72 hour self-sufficiency
			3. Installing hurricane shutters or other protective measures	3. Obtain a NOAA weather radio.
			4. Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program.	4. Obtain an emergency generator.
			5. Reinforce garage doors	
			6. Retrofit roofs to adequate standards to provide wind resistance.	
Corporate Scale	None	1. Use natural environmental features as wind buffers in site design.	1. Relocate critical infrastructure, such as power lines, underground	1. Trim or remove trees that could affect power lines
			2. Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations.	2. Create redundancy
			3. Install tree wire	3. Equip your facilities with a NOAA weather radio
				4. Equip vital facilities with emergency power sources. 5. Monitor impending storm events so that you can release employees in such a manner as to not negatively impact emergency response personnel/services.
			1. Harden infrastructure such a locating utilities under ground.	1. Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
			2. Trimming trees back from power lines	2. Establish and enforce building codes that require all roofs to withstand snow loads
			3. Designate snow routes and strengthen critical road sections and bridges.	3. Increase communication alternatives
			4. Adopt ordinances that regulate the type and quantity of tress planted near utility lines	4. Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
			5. Relocate critical infrastructure, such as power lines, underground	5. Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines
				6. Provide NOAA weather radios to the public

Severe Storms

Risk Reduction Measures	Hazard Category			
	Severe Storms			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Government	None	None		<p>7. Create/Enhance "mutual aid" agreements for response to all emergencies</p> <p>8. Create/Identify evacuation routes to be utilized during Severe Storm events.</p> <p>9. Join "Storm-Ready" program</p> <p>10. Provide early warning of impending severe storm events to identified critical or essential facilities. This would include facilities such as large employment centers, schools, hospitals.</p> <p>11. Promote emergency power supplies to private property.</p> <p>12. Improve cell phone service</p> <p>13. Provide training on new technologies such as Brine de-icing</p> <p>14. Recruit additional emergency personnel or use mutual aid agreements</p> <p>15. Increase sheltering capabilities</p> <p>16. Improve highway dept knowledge</p> <p>17. Provide diversified energy such as wind and solar.</p> <p>18. Increase capability to respond to power outages and downed power lines. Establish partnerships with utility providers through proactive planning.</p> <p>19. Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.</p> <p>20. Maintain the debris management plan to identify priority roads, establish access to critical facilities and update as need be.</p> <p>21. Maintain relationships with utility providers to ensure timely response after hazard events.</p> <p>22. Coordinate with utility providers to identify potentially hazardous trees and vegetation.</p>



Severe Winter Storms

Risk Reduction Measures	Hazard Category			
	Severe Winter Storms			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Personal scale	None	1. Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation)	1. Insulate House	1. Trim or remove trees that could affect power lines
			2. Provide redundant heat and power	2. Promote 72 hour self-sufficiency
			3. Insulate Structure	3. Be aware of inclement weather conditions, and move your vehicles off of the street as severe weather systems approach.
			4. Ensure natural gas input/release valves do not get covered in snow	4. Retrofit structures
Corporate Scale	None	None	1. Relocate critical infrastructure, such as power lines, underground 2. Reinforce or relocate critical infrastructure such as powerlines so that it meets performance expectations. 3. Install tree wire	1. Trim or remove trees that could affect power lines 2. Create redundancy in utilities and communications 3. Develop a Continuity of Operations Plan (COOP) to address operations before, during and after coastal storm events. 4. Utilize weather radios at the work place to keep your employees apprised of severe weather conditions.
Government			1. Harden infrastructure such a locating utilities under ground where appropriate.	1. Support programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.
			2. Trimming trees back from power lines	2. Establish and enforce building codes that require all roofs to withstand snow loads-- Develop/Improve/Enforce building Codes in Hazard Areas
			3. Designate snow routes and strengthen critical road sections and bridges.	3. Increase communication alternatives
			4. Adopt codes and regulations that address the issues of parking of vehicles along roadways during severe weather events.	4. Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors.
			5. Develop or enhance the capacity/capability of stormwater conveyance systems.	5. Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines
			6. Provide backup power sources at vital critical facilities.	6. Provide weather radios to vulnerable populations

Severe Winter Storms

Risk Reduction Measures	Hazard Category			
	Severe Winter Storms			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Government	None	None		<p>7. Enhance public awareness campaigns to address those issues of alert and warning and actions to take during severe weather events.</p> <p>8. Utilize the best available technology to enhance the warning systems for all severe weather events (i.e.: tornado warning systems).</p> <p>9. Coordinate severe weather warning capabilities and the dissemination of warning amongst those agencies within the planning are with the highest degree of capability.</p> <p>10. Encourage local ordinances for planting tree near lines and join Tree City USA.</p> <p>11. Increase tree management programs.</p> <p>12. Join the Community Rating System</p> <p>14. Join "Storm-Ready"</p> <p>15. Retrofit critical structures and promote hazard resistant construction</p> <p>16. Keep open communications and education of hazards for mobile home communities</p> <p>17. Retrofit above-ground utilities to u/g facilities if appropriate</p> <p>18. Create a salt reserve or research alternates to stretch salt reserve.</p> <p>19. Ensure accessibility to hospital.</p> <p>20. Provide better debris logistics and removal.</p> <p>21. Provide better communication systems and back-up communication systems to inform public of hazards and to communicate during the hazard event.</p>