

Resilience Strategy Summary

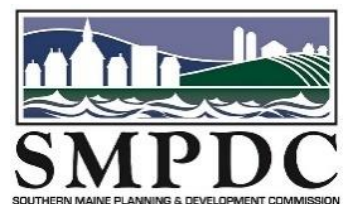
Economic Resilience Assessment and Plan for Coastal York County

Towns of Kennebunk, Kennebunkport, Kittery, Ogunquit, Wells, and York



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Southern Maine Planning & Development Commission



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Local action is critical for addressing coastal storm hazards and climate change. While the challenges posed by future sea level rise may seem overwhelming, impacts can be addressed and resilience can be built incrementally through a variety of different options. Resilience measures can be integrated into planning, policy, and regulatory tools and Maine's home rule status offers plenty of opportunities for towns to develop creative, innovative, and flexible solutions tailored to the local context.

Key Considerations

- How do short term-decisions to rebuild in the same ways contribute to the long-term vulnerability of community assets?
- How can we rethink how we recover and rebuild to protect investments and community resilience?
- What assistance is needed to enhance preparedness and resilience?
- Evaluation of the acceptable level of risk for an asset/infrastructure.
- Designs that are based on intended lifespan of assets and account for anticipated future conditions and hazards.
- Decision making that accounts for the risk tolerance and criticality of infrastructure.
- Equity considerations for evaluating and prioritizing strategies and decisions.

Scenario-Based Planning

Scenario-based planning for future coastal hazards offers an approach for evaluating natural hazards of various probabilities and risk levels in relation to a specific infrastructure asset, facility, or land use decision. It entails examining a range of potential future conditions for storms and sea levels when making planning, design, and expenditure decisions and considering factors such as:

- **Planning Horizons/Intended Lifespan:** How long should the asset be operational? How can the design accommodate anticipated conditions and potential worst-case scenarios?
- **Criticality:** What service does the asset provide? How important is it to the community? The greater the criticality of an asset, the lower its risk tolerance, which should lead to more conservative planning decisions.
- **Risk-tolerance:** What is an acceptable level of risk for the asset/infrastructure for desired or necessary operation and function?

Recommended Strategies

There are many different strategies that municipalities and regional entities can employ to enhance economic resilience to coastal storms and sea level rise. Based on the results of the coastal economic vulnerability assessment, SMPDC compiled locally relevant and implementable strategies, which are summarized below.

1. Develop financing mechanisms to fund resilience actions

Increasing coastal resilience to future storms and sea level rise is neither a simple nor inexpensive task. Towns need to plan for future conditions now to avoid damage and compounding costs in the future. Investing in adaptation and mitigation activities saves money in the long run. In addition to federal, state, and private funding opportunities, municipalities must establish local funding sources to support coastal resilience efforts.

Action	Description
Municipal Coastal Resilience Fund	Create a municipal fund specifically to address the municipality’s long-term liability due to coastal hazards.
Tax on high-value properties	Investigate requiring an additional fee on real estate transactions over a certain price.
Impact fees to support resilience	Implement impact fees on new development, commercial and/or residential, to support municipal funding for resilience measures.
Reduce over-reliance on residential property for tax revenue	Over-reliance on high-value residential property for tax revenue is a liability for coastal municipalities where those high-value properties are most at risk from storm damage and sea level rise, which will likely reduce those property values (and therefore municipal revenue) in the future. Municipalities may need to work regionally or with the state to consider shifting municipal funding to local income taxes, local sales taxes, or increased state revenue sharing.
Transfer infrastructure maintenance and upgrade costs to coastal neighborhoods	To reduce infrastructure costs, municipalities could transfer responsibility and cost of certain infrastructure to the homeowners and neighborhood associations in flood prone areas. Municipalities could then potentially charge a fee to help maintain infrastructure such as local roads, sewer and water systems, and basement pump-outs.

2. Strengthen the resilience of infrastructure, systems, and facilities, especially in vulnerable areas

Infrastructure, facilities, and systems on which communities rely will be affected by the physical impacts of coastal storms and climate change, but will also play an essential role in building resilience to those impacts. Ensuring critical assets are operational and accessible during storm and flood conditions is vital for emergency response and for protecting the health, safety, and wellbeing of community members. New infrastructure assets should be designed, built, and operated to account for coastal storms and the changing natural hazards that may occur over their lifetimes. Existing vulnerable infrastructure may need to be retrofitted or adapted to better withstand intensifying natural hazards.

Action	Description
Build redundancy into electricity generation and delivery systems	Incorporate backup electricity generation to improve continuity of service.
Relocate at-risk municipal facilities that cannot be made resilient and convert land to open space	Relocate critical facilities and infrastructure that are in vulnerable areas.
Plan for maintaining and upgrading critical infrastructure within the context of climate change	Incorporate sea level rise considerations into operation, maintenance, and investment planning for critical facilities. Adopt a policy that limits municipal expenditures in hazard areas unless for adaptation, mitigation, or resilience.
Enhance multi-modal transportation/transit options to employment and tourism centers	Support development of multi-modal transportation to economic and tourism areas (such as beaches). This action can be combined with relocating vulnerable parking infrastructure and converting parking areas to green space to mitigate storm impacts and provide flood water storage.
Stormwater capacity study	Assess the capacity of municipal stormwater systems to handle existing stormwater volumes and future climate change impacts.
Work with utility providers to improve resilience of critical systems	Facilitate information sharing and resilience planning between municipalities and operators of critical facilities regarding vulnerability and how storm hazards and climate change are incorporated into operation, maintenance, and planning procedures. While municipalities may not be responsible for maintenance or repair of some critical infrastructure, it is important that local officials are familiar with how hazards could impact the ability of critical assets to properly serve the community.
Coastal Resilience Grant or Loan fund	Municipal grant or loan fund that provides materials and equipment for resale and to provide grants to residents/businesses wishing to make changes to their property to prepare for climate change.
Modular dock systems for critical waterfront areas	Install modular dock systems that can be gradually built-up as sea levels rise, ensuring access and operation during times of elevated water level and future sea level rise.
Apply federal flood risk management standard to all public development	Zoning and/or policy requirement that public development projects apply to federal flood risk management standard of elevation or dry floodproofing to 2 feet above base flood elevation.
Mandated Real Estate Disclosures	Require sellers of real estate to disclose if property is or will be vulnerable to flooding, sea level rise, and coastal storm damage.
Vulnerability Assessments of Key Cultural Assets	Assess the risk of specific valuable properties and assets to understand relocation, adaptation, mitigation, or preservation options.
Establish method of cost-benefit analysis	Create a model cost-benefit analysis for municipalities or individual property owners to compare the costs and benefits of phased adaptation, relocation, and redesign.

3. Incorporate coastal storm hazards and climate change into plans and policies

Municipalities rely on the comprehensive planning process to create a foundation for new policy and regulation, as well as capital improvement plans to guide spending and investment. In many cases, requirements for these plans do not include considerations of storm hazards, climate change, sustainability, or resilience practices. To support sound and strategic expenditures and investments, municipalities should consider climate change and coastal storm hazards in planning processes.

Action	Description
Prioritize infrastructure projects that benefit regional resilience	Prioritize funding for infrastructure improvements that contribute to overall community resilience across the region. Projects that aim to improve resilience or consider climate change impacts should take precedence.
Incorporate climate resilience in all long-term municipal and regional planning and policy documents	Regional Planning Commissions, Economic Development Districts (SMPDC), Metropolitan Planning Organizations (KACTS) and other regional organizations should include considerations for increasing regional climate resilience and modify recommendations to align with hazard mitigation planning goals. Municipalities should consider the same for any long-range planning efforts.
Incorporate climate resilience in local Comprehensive Planning	The Comprehensive Plan forms the foundation and justification for a town to alter policies, regulations, and ordinances. Including chapters specific to climate change, sea level rise, or coastal hazards will document ways in which the town is vulnerable, and these insights can be used to shape recommended policies related to local economy, transportation, future land use, and town services.
Incorporate climate resilience in local Capital Improvement Programs	Integrate resilience criteria into capital improvement programs (CIP) and processes. Align CIP with hazard mitigation plans to identify critical infrastructure and facility vulnerabilities and plan for needed improvements.

4. Increase preparedness for responding to coastal storm events

Increasing preparedness for response during and after a storm may allow businesses to continue operations despite a threat, or to bounce back quickly thereafter. Ensuring safety, protecting assets and facilities, and coordinating response to disaster are all ways to reduce the overall negative economic impact of coastal storm hazards. Municipalities can increase resilience in storm response, repair, and recovery efforts by tracking staff time, expenses, and activities associated with damages to infrastructure so that cumulative costs can be more easily evaluated and used for cost-benefit analyses for upgrades and resilience expenditures. This information can inform municipal decision-making and help a community better understand the cost of inaction compared with investing in upgrades designed to accommodate more extreme events.

Action	Description
Track properties in flood zones and encourage owners to insure against flooding	As flood risk and vulnerabilities begin to affect assessment values, municipalities may want to track properties at risk, and work to educate and inform owners about the risks.

Action	Description
Create an online network for pre- and post-storm coordination	Creation of a web-based service where local businesses, municipalities, county emergency management, and other organizations can share critical information, needs, and support continuity efforts before, during, and after a disaster event.
Encourage municipalities to have a plan for alternative transportation routes and logistics for economic activity	With a better understanding of what key travel routes are at risk of flooding, municipalities can plan to prioritize detours and alternative routes that both redirect traffic to safety and prioritize access to key economic centers.
Expedite permitting procedures for disaster repairs for businesses	Implementing procedures for expedited permitting of commercial facility or property repairs needed for damage caused by a disaster can reduce time and processes involved for a business to quickly return to normal operation.
Develop Memorandum of Understanding for shared emergency resources in the case of a disaster	Municipalities can coordinate with neighboring communities to implement agreements for shared resources and services in the event of a disaster. This could apply to public water districts, police, fire, and other emergency services.
Plan to support workforce retention during and after a storm event	Actions such as working to ensure that schools reopen quickly and childcare facilities are available, as well as clear communication about risks and support can help businesses to inform, support and retain their workforces during and after a storm event.
Improve coordination of disaster recovery between public and private stakeholders	Support coordination and collaboration between the municipality, emergency responders, emergency management staff, and the private sector for improved disaster recovery.

5. Direct development away from vulnerable areas and promote resilient development

Where and how communities accommodate growth, development, and redevelopment profoundly affect vulnerability of people and property, as well as the quality and health of water, beaches, and coastal wetlands. Land use policies and regulations need to be updated to account for increasing risk and changing environmental conditions to protect development, people, and municipal expenditures.

While municipalities should be aware of legal considerations associated with restricting development on coastal properties, concerns of ‘takings’ (i.e., seizure of property) should not prevent policies and regulations that direct new development away from vulnerable areas and require redevelopment to incorporate protective measures that enhance resilience to flooding.

Action	Description
Municipal acquisition of vulnerable properties and managed short-term rental to generate revenue from properties until they are impacted by flooding	An alternative acquisition mechanism that limits long-term vulnerability and exposure to coastal flooding while maintaining revenue from coastal properties entails a municipality establishing a revolving loan program to support the purchase of vulnerable coastal properties and then renting those properties out, either to the original homeowner or someone else, and using those funds to pay off the loan until the property is no longer safe to live in due to flood exposure. Once that happens, the municipality can convert the property into open space to support recreation opportunities, provide flood mitigation, and allow for landward migration of coastal habitats.

Action	Description
Consider off-beach parking locations and beach restoration	Relocate beach parking infrastructure landward, away from vulnerable areas, and convert previously developed areas into open space. Develop strategic multimodal transit options to support travel from the new parking areas to the beach.
Mixed use zoning	Zoning that allows a variety of uses on a single parcel in appropriate areas. Zoning requirements can prioritize more compact mixed use in areas that have low flood risk resulting in smaller building footprints and reduced impervious coverage. Mixed use zones can encourage home-based businesses and eliminate size requirements which helps entrepreneurs find small, inexpensive spaces to start a business. This incentivizes future development in areas that are already well protected from flooding hazards.
Infill and density	Encourage growth in appropriate areas that are already developed, have public services (e.g., water and sewer), and are less vulnerable to natural hazards. Consider incentives for infill development in appropriate areas, such as areas close to goods and services.
Tax Increment Financing (TIF) as an incentive for relocation to non-vulnerable areas	An economic development tool for capturing the projected increase in tax revenue that is created by a development within a defined area and reinvests those funds into public improvements and development projects that benefit the zone and increase resilience to coastal hazards.
Permit only water dependent uses in waterfront areas and/or require public access	Through waterfront zoning, allow only water-dependent uses in appropriate areas along the coastline that are vulnerable to flood hazards. Consider allowing non-water-dependent uses only by special permit if public waterfront access is provided.
Resilient design standards	Minimum design requirements which fall into specific zones or overlay zones, requiring design resilient to base flood elevation.
Setbacks and buffers	Require buffers and structure setbacks from areas subject to sea level rise and storm surge to account for existing and future conditions and protect from flooding.
Rebuilding restrictions	Regulatory limits on rebuilding structures destroyed by natural hazards. The limits can follow a tiered system that allows for limited rebuilding (e.g., permitted only a certain number of times), completely prohibit rebuilding, or allow reconstruction with conditions.
Hazard overlay zones	Establishment of zoning districts within which certain resilient development standards, restrictions, and/or incentives apply. The intent is to require development that is resilient to coastal hazards, discourage development in at-risk areas, and/or encourage development in less vulnerable growth areas.
Conservation easements and rolling conservation easements	Rolling easements are regulatory mechanisms or interests in land that allow wetlands or beaches to migrate inland as sea level rises and thus transfer the risk of sea level rise from the environment or the public to the property owner. When implemented as a regulation, they provide an alternative to prohibiting all development in coastal areas, which may be politically infeasible, inequitable, or even unconstitutional. When implemented as an interest in land, a rolling easement offers an alternative to the purchase of the property by the government or the negotiation of a conservation easement.
Transferable development rights/credits	Land use mechanism encouraging the permanent removal of development rights in defined "sending" areas, allowing those rights to be transferred to defined "receiving" areas. The system relies on market forces to redistribute development potential from vulnerable areas toward areas with appropriate infrastructure to accommodate increased development potential.

Action	Description
Beach overlay zoning district with resilient and sustainable design requirements	Zoning overlay district designed to stimulate mixed use redevelopment of commercial and multi-family property at scales appropriate for a beachfront community to revitalize the economy, help balance the commercial and residential tax base, and protect people, property, and resources. Zoning requirements can include incentives for new and renovated buildings that are adapted to impacts of climate change.
Acquisitions and buyout programs	Acquisition, or 'buyouts', of properties vulnerable to flooding. There is a federal program through FEMA that supports and funds buyouts of flood-prone properties and conversion to open space.
Local waterfront revitalization program	Municipal planning strategy to revitalize existing development in waterfront areas through flood risk reduction measures that account for future flood hazards, including storm surge and sea level rise.
Limit public investment in flood hazard areas	Discourage new and expanded public infrastructure in areas subject to flooding through zoning requirements and municipal policies. Exceptions to this include public investment for open space and certain flood mitigation or resilience measures. The intent is to promote wise investment of public dollars and protect public expenditures.
Incentivize development in appropriate locations away from hazards	Incentives for development that is directed away from areas at risk of flooding. Incentives can be financial (<i>e.g.</i> , tax breaks) or procedural (<i>e.g.</i> , density bonuses).
Conditional Development	During the development approval process, condition coastal development with restrictions on hard armoring, vegetation removal, and site clearing.

6. Restore and support natural systems

Natural systems in coastal areas are key to enhancing the resilience of coastal communities, protecting coastal lands and populations from erosion, inundation, and storm impacts. In addition, coastal ecosystems provide other important ecosystem services, such as food provision, species and habitat protection, and recreation opportunities. Local municipalities can implement actions to sustainably manage, conserve, and restore coastal ecosystems and enhance coastal resilience.

Action	Description
Living shorelines	A living shoreline is a protected and stabilized shoreline that is made of natural materials such as plants, sand, or rock. Living shorelines can be used as a tool to provide habitat benefits that will reduce coastal erosion and help build resiliency of coastlines.
Soft-armoring	Use of beach renourishment, dune creation, revegetation, and wetlands restoration, and living shorelines to mimic natural buffers and protect shorelines from coastal erosion.
Environmental restoration of local fisheries	A variety of coastal restoration projects, including planting native vegetation, restoring tidal flows and connectivity through properly sized culverts, and clearing invasive species, can be implemented to protect coastal habitat, preserve fisheries and local jobs, and promote coastal tourism/recreation.
Coastal habitat conservation and restoration	Coastal habitats provide the first line of defense to combat the effects of flooding, storms, and wind. As a result, restoring and strengthening coastal habitats and wetlands presents a key investment to increase a community's resilience to storms and sea level rise while also promoting the local economy through enhancing coastal tourism and protecting local fisheries.

Action	Description
Promote or require Low Impact Development	Low Impact Development (LID) reduces impervious surfaces and improves stormwater drainage. Municipalities can require or incentivize LID measures for new and redevelopment sites. Additionally, municipalities can pursue opportunities to install alternatives to impervious surfaces and hardscapes.
Protect public access to coastal areas for recreation and tourism	Public access to coastal areas builds community support for coastal resilience measures and coastal habitat conservation and restoration. It also helps decrease development pressures on vulnerable coastal habitats that provide hazard mitigation. Public access to coastal areas may be protected through easements, strategic conservation, open space/conservation/cluster subdivisions, etc.
Consider value of ecosystem services in growth and development decisions	Monetize services provided by natural assets when making economic growth and development decisions across the region to adequately prioritize coastal habitats.
Integrate natural infrastructure zoning and land use codes	Integrate natural infrastructure into zoning codes to reduce conflicts between development and community resilience.

7. Support the business community to prepare for and increase resilience to coastal storm events and climate change

The detrimental economic impacts caused by future coastal storms and climate change may be mitigated by increasing the resilience of local businesses. Businesses that are better prepared for and protected against coastal hazards will be able to recover more quickly and completely following a storm event. Municipalities and regional entities can help increase the resilience of the local and regional economy by convening, collaborating with, and providing resources to the business community.

SMPDC also produced a full list of actionable steps for businesses to increase their own resilience to coastal storms and flooding, you can access that on our website here: [Business Resilience Checklist](#)

Action	Description
Encourage networking opportunities for businesses in the community and region interested in enhancing resilience	For example, develop a listserv or host regular workshops, work with existing business networks, and develop an understanding of the ongoing needs and challenges of businesses with regard to climate change.
Develop programs to help businesses improve the resilience of their infrastructure and operations	Programs may include educational, financing, and technical assistance opportunities that help reduce impacts to businesses over the long term and help them reduce their recovery time and avoid financial loss during an event.
Hazard vulnerability audits	Work with local emergency managers, chambers of commerce, and small business development centers to offer hazard vulnerability audits to small businesses in hazard areas.
Post-event marketing campaign	Tourists tend to be apprehensive about planning vacations to destinations that have recently experienced a disaster. A marketing campaign can build public confidence in recovery efforts and advertise the region as it opens back up.
Post-event business and resources directory	An online and up-to-date directory can assist residents, businesses, and municipalities in identifying businesses that are safe and open after a storm event.

Action	Description
	It could also include local organizations that can help in clean up and recovery efforts and/or contribute to post-disaster recovery planning.
Workforce training programs for jobs/skills that will be in high demand with future sea level rise	Work with schools to develop training programs for people who are working in impacted industries to learn new skills. Also encourage people to train for jobs that might become more in demand as sea level rise impacts become greater.
Resilience program for businesses to raise awareness of and prepare for climate change	Work with local stakeholder groups and chambers of commerce to establish a regional program to help raise awareness of climate change issues and impacts for businesses and support business resilience planning.
Promote buying local and consumer awareness of local seafood	Develop a campaign that promotes consumer awareness of the origins of products (e.g., seafood) and services and encourages people to buy locally and sustainably to enhance the resilience of the local fisheries.
Develop a resource guide for post-disaster financial resources	This resource guide could include available funding, application procedures, any restrictions on what can be funded, and what else is needed so that regional entities, municipalities, and local chambers of commerce are prepared to support business recovery after an event.
Adaptation-focused business subsidies	Business assistance programs focused on financial aid for resilience measures such as back-up generation, building design/reconstruction, flood insurance, or relocation.
Resilient design guidelines for coastal and marine businesses	Develop and incentivize resilient design guidelines for coastal/maritime businesses and supporting infrastructure. Design strategies include dry floodproofing, wet floodproofing, elevating fueling and mechanical equipment, salt-resistant plantings, using water-resistant materials, and redundant energy systems.
Diversification of local industries and economy	Increase diversity of local industries and support growth of creative economy, cultural tourism, and green/sustainable technology.