

**HAZARD MITIGATION PLAN  
ANNEX  
FOR  
BOROUGH OF STONINGTON, CONNECTICUT**

**An Annex of the  
Southeastern Connecticut  
Regional Hazard Mitigation Plan**

**PREPARED FOR:**

**Southeastern Connecticut  
Council of Governments**

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## **I. INTRODUCTION**

### **A. Setting**

The Borough of Stonington is a coastal community, 0.40 square miles in area, located on a small peninsula on the easterly portion of the Connecticut coast, within sight of the Rhode Island border. Bordered by tidal waters, with exception of a few areas, the Borough is located in the flood zone and is subject to varying degrees of tidal flooding on all three sides of the peninsula. The Borough is suburban in nature and is divided into various residential, commercial, and industrial zones.

The Borough of Stonington, chartered in 1801, is the oldest borough in Connecticut. Residents of the Borough are also residents of the Town of Stonington. The Borough lies within the boundaries of the Town of Stonington yet has its own governing body. The Borough offers residents and visitors the opportunity to shop in many local businesses such as gift shops, clothing stores, antiques shops, bookstores, and numerous restaurants.

The Borough is a small tightly knit community where residential structures exist very close to one another. Residents are typically involved in the numerous civic groups that are active in the Borough. Several playgrounds and parks have been designated for residents use throughout the Borough.

### **B. Purpose of Annex**

The purpose of this annex is to provide hazard risk assessment, capability assessment, hazard mitigation measures, and a hazard mitigation project ranking for the Borough of Stonington. Hazards such as earthquakes and wind storms which affect the entire region will be addressed in the Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan.

### **C. Plan Development Process and Public Involvement**

The Regional Hazard Mitigation Plan and this annex were developed through a series of meetings and the completion of written questionnaires, personal interviews, and workshops. To provide oversight of the plan development process and maximize local involvement, all member communities in the region and the two tribal affiliate members were invited to appoint a representative to serve on the Hazard Mitigation Steering Committee. Committee members and chief elected officials received notices of all the committee meetings and were encouraged to attend. Meeting notices and agendas were also sent to area media and to town and city clerks for posting in each community. Steering committee meetings were held in public at the Southeastern Connecticut Council of Governments office in Norwich. Three steering committee meetings were held during the development of the hazard mitigation plan. Verbal reports on progress were given to monthly meetings of the Southeastern Connecticut Council of Governments, which are routinely attended and covered by area press in local newspapers. Articles describing the planning process have appeared in the three issues of the SCCOG Quarterly Newsletter since March, 2003. This newsletter is mailed to 285 officials, organizations, and media within the region.

## II. HAZARD RISK ASSESSMENT

A meeting was held with representatives of the Borough of Stonington on August 7, 2003 to develop a risk assessment for the Borough. Based on the results of this meeting and additional risk assessment research, it was determined that flooding is a significant hazard.

Records dating back to 1769 indicate that the coast of Connecticut has experienced or has been threatened by hurricane tidal flooding. The low-lying shoreline areas of the Borough are subject to periodic flooding by severe high tide levels and surf damage by wind-driven waves during hurricanes, tropical depressions, "nor'easters", and occasional heavy, summer thunderstorms. Buildings located in flood hazard areas are primarily residential but also include some commercial, industrial, and critical facility structures. Most of the structures that are threatened by flooding are located within the 100-year floodplain, but some are also situated in the coastal velocity zone. Location in the velocity zone poses an increased threat to structures due to high wind and potential wave damage, as well as inundation by flood waters.

The history of coastal flooding in the Borough of Stonington has led to a series of flood prevention and property protection projects that provide some protection along the coastline. Projects have included seawalls, breakwaters, riprap breakwaters, and maintenance of these projects. However, the low-lying nature and shoreline development patterns create a high vulnerability to flooding and wave attack during severe storms.

The Borough of Stonington has no formalized program currently in place to identify the location or the number of structures that are susceptible to flooding. Such information would be valuable in directing hazard mitigation efforts to locations with the greatest risk. A potential hazard mitigation project would involve the review of all existing available data regarding flood hazards and the preparation of an inventory and assessment of structures at risk in the coastal flood hazard areas.

Such an inventory program would be the first step in completing a Flood Audit, which would provide early flood warning, guidance and technical information regarding flood risks to property owners, as well as prioritize future property protection projects. The completion of a Flood Audit would be an important step in the National Flood Insurance Programs Community Rating System by which towns can qualify for a reduction in flood insurance rates.

## **A. Residential**

Based on a review of the Borough of Stonington's Flood Insurance Rate Maps and topographic maps, residential structures that are subject to coastal flooding during significant flood events are located throughout the Borough.

The Borough's shoreline is a year-round community, intensifying risks to life and property for those who live in the coastal area. These properties are very susceptible to damage, not only as a result of flooding but also due to velocity zones and the dynamic nature in shoreline erosion in some locations.

The Borough is a mixture of residential and commercial use with areas susceptible to flooding along the western shoreline of the Borough near Stonington Harbor, Front Street, Northwest Street, a part of Gold Street, and most of Water Street. Grand Street, Church Street, Union Street, Ash Street, and Diving Street run west to east in the Borough and are also in the flood zone. The entire shoreline of Stonington Harbor is in the velocity zone and is heavily attacked by waves during coastal storms. As a result numerous seawalls and piers are located throughout this area.

Along the eastern shoreline of the Borough, the roads running north to south including Hancock Street, Main Street, parts of Cliff Street, and Hyde Orchard Street are in the flood zone. Roads running west to east in this area are Elm Street, Denison Street, and East Grand Street. The majority of the structures in the flood zone in these areas are residential in nature. Seawalls have been built to help protect property and land from wave attack and land erosion as the eastern shoreline is also located in a velocity zone and as such is impacted by waves during coastal storms.

The northern area of the Borough includes structures in the flood zone along Alpha Avenue, parts of Main Street, Cutler Street, and the Conrail/Amtrack railroad. Alpha Avenue is the only access/egress for the Borough.

## **B. Commercial/Industrial**

A large majority of the commercial structures in the Borough are found on Water Street in the flood zone. These structures would potentially sustain heavy damage during flooding. A major concern with flooding in the industrial section is the possible release of hazardous materials into the water or air. One such area is the town sewer plant, which would be affected by tidal flooding. The sewer plant is under the jurisdiction of the Town of Stonington, however, it is located in the Borough of Stonington. It is generally understood that if flood levels rose high enough, the sewer plant could be rendered inoperable.

## **C. Critical Facilities**

The vast majority of the Borough's critical public facilities are located in flood hazard areas. One exception is a small area above the flood zone that includes areas of Broad Street, Water Street, Temple Street, Main Street, and High Street. Critical facilities such as the public library, fire department, and St. Mary's Rectory, (which is also the Borough's emergency shelter) are located in this area. The proper location and protection of such critical facilities is important so that during emergencies these facilities can operate successfully. A new fire station will locate all the Borough's emergency equipment in one place and will be situated partially in the flood zone.

## **D. Transportation Corridors**

As previously noted, Alpha Avenue, the only road providing access into and out of the Borough of Stonington, is partially in the flood zone. A section known as the "Viaduct" is elevated above the railroad tracks at the northern end of Alpha Avenue. A Conrail/Amtrak railroad track crosses through the Borough and the only constructed railroad crossing is Alpha Avenue. A temporary alternative evacuation route which existed at the northern terminus of Water Street is no longer available.



The potential for serious emergency response disruption exists as the evacuation route is in a flood zone. Close evaluation of potential flooding impacts on the transportation system is of utmost importance. A proper evaluation would focus on critical transportation corridors in terms of providing safe evacuation of low lying areas and protection of those emergency response routes which are critical for use by emergency response personnel.

Borough representatives would like the consideration of a second emergency access/egress route to be a prime focus of any evaluation of the Borough's emergency response and transportation capabilities. A potential access/egress route that Borough officials are considering is Elm Street. Their concerns are heightened due to the fact that the Borough must be maintained as an evacuation route for the residents of Fisher's Island in the case of an emergency.

Town officials have also expressed concern with increased thru-traffic in the Borough. Specifically, the Borough is concerned with the transportation of hazardous materials over their roadways and their ability to respond to a major incident regarding a release of such materials.

### **III. HAZARD MITIGATION MEASURES**

The following sections provide a brief description of the types of hazard mitigation measures and programs that are available to address the natural hazards that exist in the Borough.

According to the Borough of Stonington's Flood Insurance Study completed in 1983, improvements of Stonington Harbor were adopted in 1828 and modified by enactments through 1896. These improvements resulted in a degree of flood protection. Structures providing flood protection were: a seawall along the tip of Stonington Point, the harbor's eastern entrance; a small breakwater at the west side of Stonington Point to protect the inner harbor; a riprap breakwater at the southwest side of the entrance to the inner harbor; and a riprap breakwater at Bartlett Reef at the southeast side of the outer harbor, about 0.8 miles south of Stonington Point. A project adopted in 1950 included provisions for the maintenance of the latter two breakwaters. The breakwaters and the seawall protect parts of the Borough from wave attack emanating from Fishers Island Sound, and help reduce shore erosion. No other flood protection measures exist or have been proposed for the Borough.

The State of Connecticut and the U.S. Department of Agriculture are providing for protection of tidal marshes by prohibiting future development. Coastal flooding of marshes, as opposed to developed areas, will not result in large monetary losses. Substantial areas of protected marsh are situated along the coast in the eastern portion of the Borough.

#### **A. Prevention**

Hazard prevention includes identification of risks and the use of land-use regulatory and other available management tools to prevent future damage. The Borough's planning and zoning regulations, inland wetlands and watercourses regulations, harbor management regulations and the building department's enforcement of the Connecticut Basic Building Code are all important existing regulatory mechanisms that address hazard prevention and incorporate floodplain management.

The following are examples of how hazard prevention can be accomplished through existing programs:

1. Planning and Zoning

Planning and Zoning Regulations can be tailored to be consistent with hazard mitigation planning. Establishment of Flood Prone Conservancy Districts, Coastal Resources Zones, and River Corridor Preservation Zones are all techniques that can potentially be employed to limit additional development in hazardous locations.

2. Open Space Preservation

Community Planning includes open space acquisition and preservation sections can be established or revised in a manner that is consistent with hazard mitigation planning. Acquisition of floodplain and river corridor properties should be encouraged as a municipal priority.

3. Floodplain Development Regulations

The modification of floodplain management regulations to include more restrictive development standards, which is consistent with hazard mitigation planning. The National Flood Insurance Program Community Rating System gives credit to communities that exceed the minimum floodplain management requirements of the National Flood Insurance Program. Requirements include elevating structures higher than the 100-year base flood elevations, which is an example of a more stringent standard.

4. Stormwater Management

Stormwater management regulations that limit any potential increase in the date of discharge of stormwater and that preserve floodplain storage are examples of the use of stormwater management in a manner consistent with hazard mitigation planning.

5. Wetlands Protection

Wetlands areas are generally also critical flood storage areas. By limiting wetlands development not only are important natural resource areas protected but additional floodplain development is limited.

6. Erosion and Sediment Control Regulation

Effective implementation of sediment and erosion controls include utilization of detention basins and use of other Best Management Practices to slow the velocity and limit increase in runoff. Strict adherence to the requirements are effective hazardous mitigation tools.

**B. Property Protection**

Property protection measures can address hazards at a single structure or can include multiple structures.

The following list identifies common property protection measures:

1. Relocation
2. Acquisition
3. Building Elevation
4. Utility Protection
5. Flood Proofing

Additional descriptions of property protection measures are provided in Appendix A of the Regional Hazard Mitigation Plan.

**C. Emergency Services**

Emergency communication is a critical aspect of the hazard response programs currently in place in the Borough of Stonington. Emergency Services hazard mitigation measures can be combined with other types of measures to form successful projects, or remain as stand-alone projects.

In the event of an emergency the Borough and Town of Stonington emergency management generally establish an emergency command post and mobilize the major response agencies in the town and borough. Borough representatives have reported that this procedure has assured effective communication among response agencies and efficient utilization of resources.

The major utilities that provide service to the Borough follow similar procedures. The Connecticut Light and Power Company has emergency operation centers which become operational in the event of any emergency that could impact the utilities.

The interagency communication between the Borough and independent utilities requires continued coordination to assure the critical communications link between the Borough operations and the utilities is effectively maintained.

Aspects of emergency services typically addressed in hazard mitigation include the following:

1. Emergency Communication
2. Flood Warning
3. Flood Response
4. Critical Facilities Protection

An example of emergency communication that is in use in the Borough of Stonington, is a fire alarm signal. An audible alarm horn is signaled throughout the Borough indicating the location of fire calls. The number of alarm horn signals indicates the area of emergency. The Borough also uses the emergency communication system for snow emergencies and to communicate "no school." Evacuation of the Borough may be necessary during storms and the alarm sounding the signal "7" notifies residents of the need to evacuate.

At present, the Borough owns a ladder truck, two pumpers, and a van. However, another type of emergency service that Borough officials would like to provide is a fireboat. Since the Borough is a peninsula, many of the residential, commercial, and industrial buildings are near the water. Borough officials have expressed concern that a fireboat would be necessary to pump water to these areas to help save personal property as well as the commercial fishing fleet.

In addition to the Borough's emergency equipment, Borough officials have shown interest in the installation of a dry hydrant. A dry hydrant is a permanently installed hydrant into an existing lake, pond, stream, or waterbody and is available to be connected to a pumper. It is a non-pressurized pipe system that allows firefighters access to water sources from roadways. It is relatively inexpensive with minimal maintenance and may be of use and more cost effective than a fireboat in the Borough.

Another issue that Borough emergency services must deal with is that many residential structures throughout the Borough do not have driveways or garages. As a result many residents park on the street, making the roads narrow and difficult for large vehicles to pass. Emergency vehicles are challenged with navigating through narrow streets. The Borough of Stonington enforces parking restrictions to stop cars blocking the narrow streets.

#### **D. Structural Projects**

Structural projects include utilization of the flood control strategies that have been and continue to be applied throughout Connecticut. The potential environmental impacts of structural projects are often a concern.

Borough representatives have also communicated an interest in protecting the state's last commercial fishing fleet which is stationed in Stonington Harbor. As historic flood control structures continue to age, the need for additional breakwater repairs and pier reinforcements and redesign increase. Borough officials have also expressed interest in storm sewer improvements on Orchard Street.

Structural projects that are typically considered during hazard mitigation planning include the following:

1. Levees/Floodwalls
2. Bridge & Culvert Replacement
3. Channel Modifications
4. Storm Sewer Improvements

Any prospective projects which were identified during the course of assembling this plan are included in the hazard mitigation matrix in Appendix A of this annex report. Additional information on some types of structural projects is provided in Appendix A of the Regional Hazard Mitigation Plan.

## **E. Public Information**

Public information is another type of hazard mitigation measure which, like prevention and resource protection, can be most effectively implemented in conjunction with other hazard mitigation projects.

The Hazard Mitigation Committee has identified the need for a continued and expanded program of public information. Such a program could include providing educational information to the homeowners and business owners in the flood hazard areas. A public education and information component should be included in all hazard mitigation projects undertaken by the Borough of Stonington.

The following list includes some common types of public information measures:

1. Map Information

Development of hazard maps for public distribution or posting in public locations. This type of information is easily understood and assists in raising the public's awareness of the natural hazards that exist in their community.

2. Flood Audits

For additional information regarding flood audits refer to Appendix F of the Regional Hazard Mitigation Plan.

3. Real Estate Disclosure

This is a procedure where buyers and sellers of real estate are compelled to provide notice of known hazards affecting the property to be conveyed.

4. Public Library

Libraries can be an effective location of a hazard information center. Town Halls and other public facilities can also serve as information centers. A wide range of hazard mitigation documentation should be compiled for review.

5. Technical Assistance

Local governments can provide technical assistance to homeowners and contractors regarding hazard resistant construction. An appropriate time for such assistance can be at the time of a building permit application.

6. Environmental Education

Private and public schools and adult education programs can offer environmental education classes that include hazard identification and hazard mitigation components.



#### **IV. HAZARD MITIGATION PROJECT RANKING**

Based on the hazard risk assessment analysis, the Hazard Mitigation Committee has developed a matrix of several potential hazard mitigation projects recommended to reduce the Borough of Stonington's vulnerability to natural hazards. A matrix depicting potential hazard mitigation projects and a prioritized ranking is included in Appendix A.

Projects identified in the matrix have been prioritized based on the following criteria:

- Safety of the population
- Historical damage
- New development in high risk areas
- Value of property at risk
- Consistency with plan goals and objectives

The projects were also considered on how they relate to potential health risks, structural damage, access/egress for evacuation, and protection of structures that house people with special needs and residential areas housing a large portion of the Borough's population. For additional information on projects listed in the matrix and for a complete list of criteria used in the prioritization process, please refer to the text and attachments of the Regional Hazard Mitigation Plan.

## **V. IMPLEMENTATION, MONITORING, AND EVALUATION**

The Southeastern Connecticut Council of Governments Regional Hazard Mitigation Plan and this associated community annex report were prepared with the understanding that potential funding sources may not be available within the time frame necessary to implement the recommended actions on a specific schedule. It is therefore necessary to incorporate into the plan a system of monitoring its progress and making necessary adjustments. In addition, the goals and objectives may need to be modified over time in order to meet the demands of a changing community. Accomplished activities will be eliminated, and new ones added.

The staff of the Southeastern Connecticut Council of Governments (SCCOG) serves as coordinator of the Hazard Mitigation Committee that provided oversight of the plan preparations. In accordance with § 201.6 (c)(4)(i) of the Interim Final Rule, it is recommended that the Committee meet on or before the fifth anniversary of the adoption of the plan to review the implementation progress as well as the goals, objectives, and actions outlined in the plan. With input from the Committee, SCCOG staff should prepare a report on the status of plan implementation. The report should include the following: a review of the goals and objectives of the original plan; a review of any disasters or hazards that occurred during the period; a review of each element or objective of the original plan, including what was accomplished the previous year; and recommendations for new projects or revised objectives.

FEMA also recommends that each of the local communities name a person as a local coordinator for the implementation and monitoring of the progress of the plan. This person would act as a contact for the Southeastern Connecticut Council of Governments and the State of Connecticut National Flood Insurance Program Coordinators during the grant application and cost-benefit analysis process.

**The Borough of Stonington Hazard Mitigation Projects**

<b>Hazard</b>	<b>Vulnerable Location</b>	<b>Mitigation Project</b>	<b>Priority</b>
Coastal Storms, Flooding	Alternative Evacuation Route for Borough	Evaluate and Retrofit Viaduct / Provide Alternate Access	High
Coastal Storms	Outer Harbor Breakwater	Rebuild Breakwater	High
Fire, Flood	Fireboat for Stonington Harbor	Purchase Fireboat & Dry Hydrants should be Considered as a means for Emergency Equipment	High
All Hazards	Borough Wide	Evaluate the Hazard Resistant Nature of All Critical Facilities	High
All Hazards	Borough Wide	Comprehensive Evaluation of Emergency Communication Capabilities Throughout Borough	High

**The Borough of Stonington Hazard Mitigation Projects**

Floods, Fires, Emergency Situations	Better Communication with Utility Companies	Obtain Communications Equipment / Develop Emergency Protocol	Medium
<b>Hazard</b>	<b>Vulnerable Location</b>	<b>Mitigation Project</b>	<b>Priority</b>
Flooding	Borough Wide Ex. Orchard Street	Flood Audit Program	Medium
All Hazards	Borough Wide	Review of Borough Transportation Facilities to Identify Critical Risks	Medium
Hazardous Materials Spills on Roadways	State Roads	Identify Appropriate Improvements to Traffic Infrastructure and Emergency Response Training and Equipment	Medium

**The Borough of Stonington Hazard Mitigation Projects**

All Hazards	Borough Wide	Implement a Reverse 9-1-1 System to Automatically Call Telephones Throughout Borough, Relaying Important Information During an Emergency	Low
All Hazards	Borough Wide	Distribute or Post Public Information Regarding Hazards in the Borough	Low
<b>Hazard</b>	<b>Vulnerable Location</b>	<b>Mitigation Project</b>	<b>Priority</b>
All Hazards	Borough Wide	Evaluate Emergency Shelters, Update Supplies and Check Communication Equipment	Low
All Hazards	Borough Wide	Maintain Emergency Personnel Training as well as Maintaining and Updating Emergency Equipment and Response Protocols	Low

**The Borough of Stonington Hazard Mitigation Projects**

Wind Hazards	Borough Wide	Evaluate and Consider Burying Power Lines Underground and Away From Possible Tree Damage	Low
Earthquake Hazards	Borough Wide	Complete an Earthquake Survey of all Critical Facilities and Infrastructures	Low
Flooding	Borough Wide	1) Complete Catch Basin Surveys to Identify Catch Basins in need of Maintenance and/or Replacement  2) Complete Culvert Survey to Determine Priority for Maintenance and/or Replacement Plan	Low
<b>Hazard</b>	<b>Vulnerable Location</b>	<b>Mitigation Project</b>	<b>Priority</b>

**The Borough of Stonington Hazard Mitigation Projects**

Fire Hazards	Borough Wide	Complete a Survey of Fire Hydrants in Borough to Assess Vulnerabilities and Capabilities for Fire Protection	Low
Coastal Hazards	Coastal Areas	Improve Property Protection with Storm Shutters and when Possible Elevate Property above the Base Flood Elevation.  Borough should Consider Acquisition of Properties that are Repeatedly Flooded	Low