

**Integrated Multi-Hazard Mitigation
in Rhode Island**

A Collaboration of
URI Coastal Resources Center Sea Grant Program
and
Rhode Island Emergency Management Agency

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INTEGRATED MULTI-HAZARD MITIGATION IN RHODE ISLAND

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Introduction

The US has suffered a series of natural disasters in the last five years amounting to billions of dollars in damages. These disasters have affected many types of environments and many different communities, from fires in suburban California and massive floods in the farmlands of rural America, to blizzards in the highly populated coastal zone of the Atlantic seaboard. Rhode Island has been lucky in the recent decades, with *relatively* mild damages from natural disasters. Even with this in mind, Hurricane Bob, which struck the northeast coast in 1991 caused over \$60 million in marine losses alone; the great blizzard of 1978 resulted in 21 deaths and an estimated \$10 million in lost production and wages (RIEMA, 1994).

Over the past year the University of Rhode Island's Coastal Resources Center Sea Grant program (CRC/Sea Grant) and the Rhode Island Emergency Management Agency (RIEMA) have worked with the Federal Emergency Management Agency (FEMA), various state agencies and numerous local officials, and private industry to establish a framework for developing proactive, multi-hazard mitigation strategies directed at local and state governments. Grant monies were allocated by RIEMA to CRC/Sea Grant to provide technical assistance for this effort. Prior to this effort, there was no mechanism in Rhode Island for local and state government agencies to work *together* in a proactive way to reduce damages and costs from natural disasters.

Activities associated with the RIEMA grant were successful in laying the foundation at both the state level and in two pilot regions to develop a community-based state strategy. Sea Grant has allocated additional funds to the CRC (through 1999) to provide technical assistance to state and local efforts to build on this foundation and complete the state's comprehensive strategy for multi-hazard mitigation. As seen in Figure 1, in addition to completing the efforts outlined in the RIEMA grant, several accomplishments have been made towards achieving the Sea Grant goals.

It has been shown that lives and property can be saved through appropriate planning and mitigation techniques. Proper placement, construction, or retrofit of residential and other structures will reduce the threat to the inhabitants and to the physical property. Mitigation planning will provide an opportunity for local and state government to work together to ensure the proper placement, construction or retrofit of residential and other structures. Building on the progress of the past year of laying a foundation of understanding and a framework of cooperation, the efforts of the next several years will enhance the abilities of the public and private sectors to work towards a sustained program of hazard mitigation, where Rhode Island can be less vulnerable to the costly impacts of natural disasters.

This process to *guide* the state's hazard mitigation activities will occur in a progressive manner. Currently, most mitigation activities are selected after the natural disaster event occurs, when the building has collapsed or the road has flooded. This new process of proactively developing programs and partnerships will allow the state to actively implement activities that mitigate natural hazards *before* the natural disaster occurs. This progressive stance will also enable the state and local governments with assistance from RIEMA, FEMA, and other identified public and private partners to evaluate, identify and solve weakness that presently exist within the system.

Figure 1. Highlighting Accomplishments in the Hazard Mitigation Program

Following table outlines the program objectives, the funding source (in parentheses), and the actions accomplished (✓) during the period of February 1995- February 1996.

Objective 1. Develop State Strategy: Using a two-track approach and experience from two pilot regions, establish state policy that guides municipalities and state agencies in developing hazard mitigation plans; integrate hazard mitigation planning into the regular activities of state/local agencies; inventory and compile existing/proposed hazard mitigation activities at state/local levels.

Tasks:

- .1. Develop an expanded State Hazard Mitigation Committee with clearly articulated purposes and procedures (RIEMA).
 - ✓ Assessed the State Hazard Mitigation Committee needs.
 - ✓ Expanded the State Hazard Mitigation Committee to address broad input needed for future actions.
 - ✓ Developed a Hazard Mitigation Resources Committee.
 - ✓ Conducted a workshop for the Hazard Mitigation Resources Committee.
 - ✓ Conducted two working sessions with the existing Hazard Mitigation Team and two work sessions with the enhanced Hazard Mitigation Committee.
 - ✓ Developed an implementation framework for the hazard mitigation program.
 - ✓ Articulated goals, purposes, operation, and short-term actions for the committees.
 - ✓ Designed a project which includes activities of the state committees and regional working groups.
2. Identify risks within the state to assist in understanding perceptions, risks, and mitigation opportunities (SEA GRANT).
 - ✓ Conducted a workshop with the Hazard Mitigation Committee to identify risks to Rhode Island.
 - ✓ Submitted a proposal to FEMA to computerize local risk assessments, manage information regarding statewide risks, and assist in developing mitigation strategies.
3. Develop a hazard mitigation strategy that outlines the state's goals and policies, existing and future mitigation activities, and mechanisms for incorporating hazard mitigation into daily procedures. The bundation of such a strategy will be the local hazard mitigation strategies, goals, and initiatives (SEA GRANT).
 - ✓ Developed an outline for the strategy.
 - ✓ Developed a library of materials to be used in policy development.
4. Recommend a framework for receiving NFIP grants to implement flood hazard mitigation projects in regions that have plans, and to receive planning grants for other regions of the state (SEA GRANT).
 - ✓ scheduled the completion of draft state plan and three regional plans prior to October 1996.

Objective 2. Develop Local Pilot Projects: Initiate local planning process in two regions for developing local hazard mitigation plans. These pilot planning efforts/results will provide foundation for state strategy development. Successful implementation will depend upon close coordination between state agencies and town officials.

Tasks:

1. Develop two regional hazard mitigation working groups that represent local hazard mitigation interests and facilitate information exchange among local communities in areas of common hazards; develop a mission statement, maintain database of individuals, and hold meetings with working groups (RIEMA).
 - ✓ Developed two regional working groups consisting of planners, building officials, and EMA director from South County and Blackstone River Valley.
 - ✓ Conducted initial meetings of the working group in each region; scheduled follow up meetings
 - ✓ Confirmed that regional working groups were an effective means to develop hazard mitigation plans and to exchange information within towns and within regions.
 - ✓ Identified the roles and responsibilities and short-term actions of the working groups.

- √ Gained consensus regarding the regional approach to developing plans.
 - √ Developed a computer database of local **EMA** directors and local officials in RI.
 - √ Identified members from the regional working groups to participate in the expanded State Hazard Mitigation Committee.
2. Identify risks, existing mitigation activities, and common perceptions to hazard mitigation (SEA GRANT)
 - √ Conducted a risk assessment survey in South County and Blackstone River Valley.
 3. Develop a strategy for regions that will include a matrix of risks, mitigation activities, and prioritized actions. Plan should include an appendix of examples that have been successful in other communities as mitigation actions and implementation strategies (SEA GRANT).
 - √ Developed methodology for regional/local strategy development.
 - √ Developed a matrix tool to identify risks at the local level.
 - √ Developed a matrix tool to determine mitigation strategies at the local level.
 - √ Identified nine planning regions for hazard mitigation plan development.
 - √ Developed a work plan to complete local strategies.
 4. Identify planning and implementation activities related to flood hazards mitigation, so that communities can be prepared to receive NFIP grants for anticipated start in October 1996 (SEA GRANT).
 - √ Scheduled the completion of local plans within three regions prior to October 1996.

Objective 3. Develop Network of Influential Individuals: Evaluate the role of, and develop partnerships with, the private sector (including insurance, building, banking and real estate, interests) and the Building Officials Code Association (BOCA) to implement hazard mitigation and risk reduction initiatives (SEA GRANT).

Tasks:

1. Determine the role of the private sector, including insurance, building, banking and real estate, and BOCA, to establish partnerships to implement hazard mitigation.
 - √ Met with Insurance Institute for Property Loss Reduction to discuss opportunities for partnerships.
 - √ Initiated coordination efforts with the Building Code Effectiveness Grading Schedule.
 - √ Began ongoing discussions with the State Building Commission regarding the development of a retrofitted demonstration model in Rhode Island.
 - √ Initiated discussions regarding the development of a panel on hazard mitigation at the 1996 BOCA annual meeting in Providence.
2. Determine needs for training and public education to advance the implementation of hazard mitigation.
 - √ Opened discussions with the state Building Commission on training for building inspectors.
 - √ Assisted in coordinating and training local and state in the Hazard Mitigation Planning course in May 1995 in Rhode Island.

Objective 4. Influence National Policy and Program Development: Work with other Sea Grant Programs, states and federal agencies to exchange information and develop programs that would advance policy and program development of community-based hazard mitigation (SEA GRANT).

Tasks:

1. Communicate with other Sea Grant programs.
 - √ Met with Sea Grant programs, both nationally and regionally to discuss interactions and cooperative efforts regarding hazard mitigation.
 - √ Participated in setting up an Internet news group for Sea Grant programs regarding hazard mitigation.
2. National Task Force.
3. National Conference.
 - √ Participated in the National Mitigation Conference.
4. Regional Workshops.
 - √ Coordinated and facilitated a panel discussion regarding partnerships for planning at the September 1995 workshop **Preparing our Communities for Changes in Disaster Assistance.**

HAZARD MITIGATION IN RHODE ISLAND

Need for Hazard Mitigation Planning

Increased Risk. Increased Threat

Although the population is threatened by other natural events, such as earthquakes and fires, the Rhode Island Emergency Management Agency (RIEMA) reports that the top three natural disasters that have struck the state on a recurring basis are hurricanes and related coastal flooding, winter storms, and riverine flooding (RIEMA, 1994). According to national hurricane experts, the cycle of relatively low hurricane activity is ending and future storm events are likely to occur more often and with more intensity. This poses great threat to coastal states like Rhode Island, where history shows devastating results of natural disasters. The top three disasters in terms of loss of life, damage to property, and expense of recovery include the hurricanes of 1938 and 1954 and the Blizzard of 1978 (Vallee, 1991; RIEMA, 1994). In these three major events, 247 lives were lost and over \$300 million in damage was sustained, primarily due to flood waters and wind (Vailee, 1991; RIEMA, 1994).

The potential impact of future events is made more significant because of the rapid development in high-risk areas that has occurred during the cycle of low natural disaster activity. Between 1980 and 1988 the coastal property in Rhode Island has grown in value by 60 percent from \$32 million to \$53 million (Flesner, 1989). In 1993, it was estimated that the value of insured coastal property exposures in Rhode Island was over \$83 billion, which was an increase of 153 percent since 1980 (IIPLR, 1995). Coastal areas on the south shore of Rhode Island, which were home to summer cottages during Hurricane Carol in 1954, now support a higher density of both seasonal and year-round populations. Earthquake-prone areas lining the shore from Providence to South County have grown in population and infrastructure since the last significant earthquake that marked the Richter scales at 4.6 in 1951. Riverine flooding has become more significant not only because of increased rainfall but also because natural floodplains have been destroyed and private dams have not been maintained, creating a threat of structural failure and excessive flooding.

It can be inferred then that a high percentage of the at-risk population of Rhode Island has never been subjected to a major event and therefore has no experience in preparing for or responding to natural disasters. It is evident that human life, private and public property, and natural resources stand an enormous risk of damage and destruction.

institutional Restructuring

After Hurricane Bob, the Rhode Island Emergency Management Agency (RIEMA) updated its state hazard mitigation plan (referred to as the Section 409 plan) as required by FEMA through the Stafford Act. This document provided an inventory of ongoing and expected hazard mitigation activities. This information was critical in assessing the state's existing capacity to implement hazard mitigation activities. However, the 409 document did not provide an adequate decision-making framework for allocating mitigation funding made available through Section 404 of the Stafford Act, which results from declaration of a Federal disaster. This State Hazard Mitigation Committee was formed by RIEMA to allocate mitigation funding from Hurricane Bob and included representatives from RIEMA, Department of Transportation, State Building Commission, Coastal Resources Center, Department of Environmental Management, Public Utilities Commission, and the State Planning Division's National Flood Insurance Program.

The primary purpose of this committee was to allocate federal funding for hazard mitigation projects after Hurricane Bob. Instead of using a hierarchy of priorities for the state, the committee used technical criteria provided by the Federal Emergency Management Agency (FEMA) to make funding decisions. Although these criteria were helpful in ensuring that the proposals were for appropriate mitigation activities, they were not helpful in identifying overall mitigation activities that were priorities in Rhode Island.

In 1995, both RIEMA and FEMA began rethinking the mitigation approach, placing greater emphasis on proactive planning efforts. Both agencies also began viewing this process as having two tracks—one beginning at the local level and moving up, the other starting at the federal level and moving down. This approach promoted, for the first time, communication among local, state, and federal partners about mitigation. At a national level, in the context of increasing damage and losses from natural disasters, mitigation began to be seen as a cornerstone to emergency preparedness. This focus is clearly articulated in FEMA's *National Mitigation Strategy*.

Goals of the Hazard Mitigation Project

The National Mitigation Goals, as outlined by FEMA in the National Mitigation Strategy, provides a foundation for developing statewide goals and objectives. The National Mitigation Goal has two components:

By the year 2010,

- (1) To *substantially increase public awareness* of natural hazard risk, so that the public demands safer communities in which to live and work; and
- (2) To *significantly reduce the risk* of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from natural hazards.

Goals and objectives established for Rhode Island are consistent with the National strategy. RIEMA has made a significant investment in developing and promoting a proactive approach to hazard mitigation. Mitigation is becoming a key focus area for the organization and is highlighted by its Partnership Performance Agreement (PPA) with FEMA, which states that within five years they expect to have achieved the following:

- Improve the sustained hazard mitigation capability of state and local jurisdictions.
- In partnership with state and local jurisdictions, improve building codes, zoning ordinances, and infrastructure design standards, and develop adequate enforcement capability to minimize risks associated with known hazards.
- Establish for state and local jurisdictions a public and private sector partnership to promote, plan, and coordinate activities that enhance mitigation.
- Develop an all-hazard multi-objective mitigation plan.

Listed below are the overall objectives of the Hazard Mitigation Project, combining objectives developed for both the RIEMA grant (1995- 1996) and Sea Grant (which goes through 1999).

- **Develop State Strategy:** Using a two-track approach and experience from two pilot regions, establish state policy that guides municipalities and state agencies in developing hazard mitigation plans; integrate hazard mitigation planning into the regular activities of state/local agencies; inventory and compile existing and proposed hazard mitigation activities at state/local levels.

- **Develop Local Pilot Projects:** Initiate local planning process in two pilot regions for developing local hazard mitigation plans. These pilot planning efforts/results will provide foundation for state strategy development. Successful implementation will depend upon close coordination between state agencies and town officials.
- **Develop Network of Influential Individuals:** Evaluate the role of, and develop partnerships with, the private sector (including insurance, building, banking and real estate, interests) and the Building Officials Code Association (BOCA) to implement hazard mitigation and risk reduction initiatives.
- **Influence National Policy and Program Development:** Work with other Sea Grant programs, other states, and federal agencies to exchange information and develop programs that would advance policy and program development of community-based hazard mitigation.

Approach to the Project

The long-range goals of RIEMA and FEMA regarding hazard mitigation, led to agreement that community-based hazard mitigation planning efforts would be initiated. The program was designed to provide both a framework and a strategy for Rhode Island's hazard mitigation plan. The initial phase of the Hazard Mitigation Program funded by RIEMA, took place during the one-year period of February 1995 to February 1996 with the assistance of the Coastal Resources Center/Sea Grant program (see proposal in Appendix 1). As the RIEMA grant comes to closure in February 1996, CRC will be funded solely by Sea Grant monies to provide RIEMA and communities with the technical assistance required for completion of this project (Appendix 2).

It is anticipated that the first draft of the state plan will be completed in the summer of 1996, when two pilot regions covering 14 communities in South County and the Blackstone River Valley have developed their local and regional strategies. Efforts will then be focused on completing plans for the five communities in Newport County by the fall of 1996.

Local Process

In order to develop a community-based statewide strategy for multi-hazard mitigation, it was essential to initiate efforts for an action strategy at the local level. South County coastal communities and the Blackstone River Valley Corridor were chosen for pilot regions. These two regions vary in types of risks (wind and wave risks versus riverine flooding) and in types of communities (suburban towns with a heavy seasonal tourist component versus urbanized area with a strong historical character). Mitigation strategies developed for these regions will reflect the differences in risks and pertinent issues and will provide a broad spectrum of mitigation techniques to be applied in other communities throughout the state.

Technical assistance provided by CRC and RIEMA's State Hazard Mitigation Committee for developing local plans will be the cornerstone of the state's strategy. Local communities typically do not have the resources to devote to such planning efforts, and at this time no funding has been allocated by the state to complete these plans. It is hoped that federal funding from the National Flood Insurance Program can contribute necessary resources for planning and mitigation strategies aimed at reducing losses from floods. Experience gained and techniques developed from these regions will feed into the development of the state strategy, which will include guidelines for development of local plans for the other regions.

The first year of the Hazard Mitigation Project has included extensive efforts at the *local level* to:

- ⇒ increase the understanding of local officials of the need to develop proactive initiatives
- ⇒ encourage coordination among local officials within towns (planners, building inspectors, and emergency management officials)
- ⇒ facilitate exchange of information among communities for regional initiatives
- ⇒ initiate a risk assessment and a mitigation strategy based on local information and priority issues

State Process

CRC has been working concurrently with a broad spectrum of state agencies (through the Hazard Mitigation Resources Committee and the State Hazard Mitigation Committee) to establish the goals and the framework for implementing hazard mitigation through a comprehensive state strategy. The state/local cooperation is essential for developing realistic local and state plans since many of the implementation strategies will rely on well-developed partnerships and integrated policy as well as regulatory, management, and financial initiatives. Workshops held in the spring and fall of 1995 brought various stakeholders together from government and private industry to exchange information and work towards developing integrated local and state plans. Discussion and interaction along both state and local tracks is essential for setting agendas at the state level, where priorities and funding opportunities are based on information from the local plans.

The end result of this two-track process will be a state strategy—with an initial draft prepared by the summer of 1996—that addresses multi-hazard mitigation at the local level. The state strategy will be a combination of projects, recommendations, and policies resulting from *both* local planning efforts and the planning initiatives undertaken by RIEMA's Hazard Mitigation Committee with the state agencies. Each of the communities will also have a strategy specific to its risks and local issues.

Integration of Hazard Mitigation into Existing Plans

Rhode Island has many planning and regulatory programs, several of which already incorporate hazard mitigation (for example, the Coastal Resources Management Council policy on construction setbacks that reduce impacts from coastal erosion or wave attack). It was felt that the hazard mitigation strategy would best serve the interests of the state if actions were integrated into *existing* policies and programs rather than generating a separate plan and bureaucracy. This approach would create less overlap, less tendency to "put the plan on the shelf", and increased likelihood of success by incorporating hazard mitigation techniques into the everyday practices of Rhode Island town government, land use decisions and development plans.

Effective disaster planning, mitigation, and response are dependent upon partnerships and cooperative efforts among town, state, and federal agencies, adjacent communities, the public and private sectors, and the community at large. Cooperation among these entities will improve the ability to prepare for hazardous events and reduce the need for recovery activities, thereby reducing costs and disruption of lives. This can be seen from the results of a regional workshop for South County communities held in October 1995, in which local and state building officials, planning officials, and emergency management officials came together to understand the needs and issues associated with hazard mitigation and to recognize the cross section of concerns represented by these individuals. With this broad understanding, they developed recommendations for CRC and RIEMA to move forward to develop a strategy for reducing risks in the region.

RESULTS OF THE RIEMA GRANT

To initiate the process of mitigation planning and to make progress on the Performance Partnership Agreement goals, RIEMA provided funding to CRC/Sea Grant to achieve the following:

- Augment the existing state hazard mitigation council with additional resource people.
- Set goals, objectives, and a working strategy for the augmented state Hazard Mitigation Team.
- Develop and convene regional hazard mitigation councils made up of local emergency management agency directors and other appropriate local officials.
- Improve awareness at the local level of hazard mitigation needs and build agreement on and standards for a suitable course of action.

CRC/Sea Grant was selected for this project because of its ability to play the role of neutral convener and its experience in the policy process, understanding of the Rhode Island context, and familiarity with the existing 409 plan and planning process. CRC also has worked with RIEMA and the RI Hazard Mitigation Committee to develop standards and practices for mitigating storm damage to local recreational harbors; this project created policy that has been incorporated into the Coastal Resources Management Council's Guidelines for Harbor Management. Figure 2 highlights the accomplishments of the RIEMA grant.

Enhance the State Hazard Mitigation Team

The tasks described below were completed by CRC/Sea Grant during February 1995-February 1996 in pursuit of the overall program goals of laying a foundation for a state strategy for hazard mitigation in Rhode Island with input and coordination from a broad array of public and private interests.

Task A: Evaluate strengths and weaknesses of existing state Hazard Mitigation Council and identify current goals and objectives. CRC and RIEMA conducted a half-day workshop in April 1995 for the existing State Hazard Mitigation Committee. The purpose of this workshop was to identify specific committee responsibilities (goals and objectives) and to determine additional representation on the committee. This was the first opportunity for the committee to discuss the potential for *proactive* hazard mitigation planning (beyond proposed 404 mitigation activities).

The CRC facilitated a discussion which produced a list of names from state and local government and the private sector of individuals/agencies that would complement the existing committee. There was a great deal of discussion about the optimal size of the committee. From the operational perspective, it was clear that a committee that was too large could not be managed efficiently. From the planning and implementation perspective, it was clear that the process needed a diversity of stakeholders from both state and local government and the private sector. There was also acknowledgment that for this committee to have standing and authority, it would need high-level representation from state government, such as officials at the director level. However, such representation would be too time intensive for directors. Acknowledging the need to keep the committee a responsible size, RIEMA representatives reduced the number of people proposed for committee participation.

Figure 2. Accomplishments of the RIEMA Grant

Accomplishments of the RIEMA Grant (February 1995-96)

Augment the existing state hazard mitigation council with additional resource people.

- / Assessed the State Hazard Mitigation Committee needs.
- / Expanded the State Hazard Mitigation Committee in order to broaden the input needed for future actions.
- / Developed a Hazard Mitigation Resources Committee.
- √ Conducted a workshop for the Hazard Mitigation Resources Committee.
- √ Conducted two working sessions with the existing hazard mitigation team and two work sessions with the enhanced hazard mitigation committee.

Set goals, objectives, and a working strategy for the augmented State Hazard Mitigation Committee.

- √ Developed an Implementation Framework for the hazard mitigation program.
- √ Articulated goals, purposes, operation, and short term actions for the committees.
- √ Designed a project **workplan** which includes activities of the state committees and regional working groups.

Develop and convene regional hazard mitigation councils comprised of local Emergency management agency directors and other appropriate local officials.

- √ Developed two regional working groups consisting of planners, building officials, and EMA directors from South County and Blackstone River Valley.
- √ Conducted initial meetings of the working group in each region.
- √ Scheduled second meetings in each region.
- √ Confirmed that regional working groups were an effective means to develop hazard mitigation plans and to exchange of information within towns and within regions.
- √ Identified members of the regional working groups to participate in the expanded State Hazard Mitigation Committee.

Improve awareness at the local level of hazard mitigation needs and build agreement on and standards for a suitable course of action.

- √ Developed a network of local officials who will be working on hazard mitigation plans
- √ Gained consensus regarding the regional approach to develop plans through technical assistance to regional efforts and individual towns.
- √ Developed a computer database of local EMA directors and appropriate local officials in RI.

To ensure a wide range of input, a Resources Committee was created to provide input to the State Hazard Mitigation Committee, set direction, and identify resources that could be used in mitigation planning (Figure 3 shows the implementation framework and the interactions among the committees/agencies addressing hazard mitigation). This arrangement also allowed the director-level agency representatives to participate in the process without making a large time commitment, and provided a broad perspective from both public and private sectors regarding the need for and implementation of hazard mitigation. The Resource Committee met in November 1995 and heard presentations from Richard Moore, FEMA's Associate Director for hazard mitigation as well as other individuals from public and private sector, who highlighted the needs for hazard mitigation. Discussion groups were formed to brainstorm about hazard mitigation strategies in Rhode Island. Appendix 3 summarizes the key points of the meeting and outlines the initial recommendations of the Resources Committee.

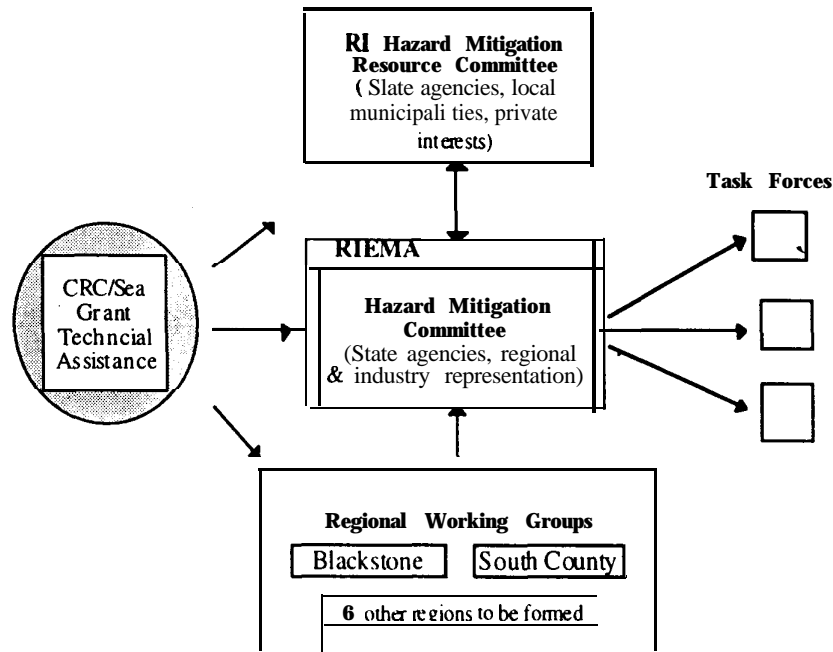


Figure 3. Implementation Framework

Task B: Assess State Hazard Mitigation Committee needs. Assessment of the role of the existing Hazard Mitigation Committee determined that the committee's responsibilities should be expanded from the existing goal of evaluating 404 hazard mitigation grants to include proactive hazard mitigation planning. Meetings and conversations of the State Hazard Mitigation Committee resulted in a draft document defining roles and responsibilities. This document outlined how the committee would operate and what its purposes would be. Discussions included a final decision regarding the enhancement of the state committee with representation from the Coastal Resources Management Council, the fire marshal's office, the regional working groups, and representatives from both the building industry and the insurance industry. In addition to outlining the role of the state committee (formed as an output of Task A), the document also discusses the State Resources Committee and the regional working groups. This document was

reviewed by the state committee and revised accordingly. The implementation framework document (Appendix 4) provides an overall picture of the state's approach, confirms participation on the committees and outlined the State Hazard Mitigation Committee's interactions with the Resource Committee and regional working groups.

Task C: Establish a commitment by key agencies to participate on State Hazard Mitigation Team. From the project's beginning, there was discussion with RIEMA and FEMA about ensuring agency cooperation. The state committee is authorized by the Governor; RIEMA already had an existing Memorandum of Understandings (MOU) with each agency participating on the existing State Hazard Mitigation Committee. However, there was general agreement that these connections and commitments had to be strengthened. Furthermore, the MOU would need to reflect the new direction of the committees regarding planning and developing a proactive hazard mitigation program for the state and would incorporate the roles and responses of the committee. New MOUs with the agencies represented on the enhanced State Hazard Mitigation Committee and Resources Committee are currently being drafted by RIEMA. Once signed, these should formalize the relationship between RIEMA and the other agencies. Commitment was also enhanced by the activation of the Resource Committee, on which many of the agency leaders participate. Participation on this committee gives agencies the opportunity to see the larger framework for statewide hazard mitigation and the role their organizations must play for successful implementation.

One method for gaining commitment and high-level support for such a program is an Executive Order establishing and formalizing a structure for hazard mitigation in Rhode Island. This approach was discussed with RIEMA extensively. However, recommendations of RIEMA staff and other considerations ruled against pursuing an Executive Order. CRC/Sea Grant and RIEMA therefore went forward with enhancing the existing structure of the hazard mitigation team.

Task D: Conduct working session(s)/retreat to establish goals, objectives, and operational procedures for state hazard mitigation. After the first meeting of the Resource Committee, the State Hazard Mitigation Committee met to review and finalize the program framework and the committee roles and responsibilities (as seen in Appendix 4). New members of the committee attended this meeting, thereby initiating the expanded efforts of the enhanced State Hazard Mitigation Committee. In addition to reviewing roles and responsibilities, the committee reviewed the proposed approach designed by CRC to identifying risks statewide. A subsequent meeting was held with the committee to evaluate statewide risks.

Overall Lessons Learned While Working at the State Level

1. A strong state leader is needed. To ensure interagency cooperation and support in planning and implementation, the program must find a leader within the state hierarchy who can both protect the process and open avenues for the process. In Rhode Island, leadership outside of RIEMA has not emerged. The need for this leadership will become increasingly important as the process moves forward with mitigation planning and implementation, both of which require state resources supporting policy development and funding for mitigation activities at the state and local levels.

2. Agency dedication is critical. From the agencies CRC has interacted with, CRC has found strong support for the process. However, the depth of the support has not been tested. Agency staff have dedicated time for meetings and planning initiatives. The new MOU developed by RIEMA will outline new responsibilities related to proactive

planning. In addition, support for implementation will be critical in instituting new policies that support multi-hazard mitigation at the state and local levels.

3. Committee momentum is essential. During the first six months of the grant, much effort was spent determining the size and makeup of the committee, and little action was taken. This slowed the process considerably but did not appear to weaken the Hazard Mitigation Committee's dedication to the process. To maintain momentum, the committee and other state/local officials participated in mitigation activities that were outside of the original scope of work. CRC provided assistance to RIEMA in conducting a two-day training program on hazard mitigation, conducted by consultant Clancy Philipsborn.

Create Hazard Mitigation Working Groups Organized by Regions

The tasks described below were completed by CRC/Sea Grant during February 1995-February 1996 in pursuit of the overall program goals of developing community-based hazard mitigation planning, using pilot projects in two regions with the goal of applying the lessons learned to the remaining regions in Rhode Island.

Task E: Identify all local Emergency Management Agency directors and other appropriate local officials. This task was easily achieved because RIEMA maintains and updates the list of local Emergency Management Agency (EMA) directors. CRC then identified other collaborators at the local level who would be essential in planning and implementation, including planners, building officials, and town administrators.

Task F: Maintain an accurate listing of Emergency Management Agency directors and other appropriate local officials. This database was computerized by CRC/Sea Grant using the Fox Pro software. The information was collected by using the EMA records as a base and adding the names of other appropriate officials who play a role in mitigation at local levels, as identified above. The database also included members of the Resource Committee and Hazard Mitigation Committee. The database will be updated regularly by CRC, and will be extremely useful in mailings for all future hazard mitigation meetings, workshops, and training activities.

Task G: Establish regional councils. The original task called for the establishment of five regional councils, one for each county in Rhode Island. However, it quickly became apparent that it would be impossible to establish five councils and provide the necessary support to maintain any momentum within all of the regions during the first year of this project. Therefore, the state committee suggested establishing just two working groups and developing a time line for establishing the others. This would allow CRC to focus on establishing the councils and providing them technical assistance to begin hazard mitigation planning. Before areas were selected, the state committee also suggested that instead of dividing the state by county, it would be more logical to divide it by "shared risk." This means that communities that share a common type of risk, such as riverine flooding, coastal storms or heavy snow, be clustered together. In this way, the state was divided into eight regions, as described below in Figure 4.

The first two regions of focus are South County and the Blackstone River Valley Corridor. South County was selected first because of the known threat to the area from hurricanes, nor'easters, and associated flooding; the progressive style of planning in the region; and the existing network of planners that CRC could easily access. The

Blackstone was selected second because of the very different risk that the area faced compared to South County. The state committee subsequently decided to initiate efforts in the summer of 1996 in the Newport County region, because of its potential for damage from coastal storms and because of the anticipated activity due to ongoing redevelopment and economic development. It is anticipated that CRC/Sea Grant and RIEMA will be able to provide technical assistance to four regions per year, thereby completing the local/regional plans within the next two years. At that time, the state's strategy will be revised to include all local and regional mitigation strategies.

Figure 4. Planning Regions for Hazard Mitigation

Rhode Island has been divided into eight "risk" regions for developing hazard mitigation plans

- **South** County (Westerly, Charlestown, S. Kingstown, N. Kingstown, Narragansett)
- Blackstone (Woonsocket, North Smithfield, Cumberland, Lincoln, Smithfield, Central Falls, Pawtucket)
- Newport County (Jamestown, Newport, Portsmouth, Little Compton, Tiverton)
- **Bristol** County (East Providence, Bristol, Tiverton, Barrington, Warren)
- Greenwich Bay/Kent County (East Greenwich, West Warwick, Warwick, Cranston)
- Providence (Providence, East Providence, North Providence)
- Wood Pawcatuck (Hopkinton, Richmond, Exeter, West Greenwich, Coventry)
- North West Region (**Scituate**, Foster, **Glocester**, Johnston, **Burryville**)
- New **Shoreham** (Block Island)

Task H: Assist in **planning** and **provide support** for the first meeting of each regional council. Prior to the formal *first* meeting in each region, there were numerous informal and information meetings with town planners, regional non-governmental organizations, and other key contacts to determine content and invitees. In October 1995, CRC coordinated a meeting for the South County pilot region with the input of several of the planners from the region. The meeting brought together planners, building officials, and EMA directors from the five communities. This interaction between officials in individual towns was extremely worthwhile, as were the inter-town discussions. State agencies and FEMA were represented, providing a resource base and a foundation for discussion of the need for hazard mitigation in a larger state and federal context.

The group agreed that the state/local cooperation in developing hazard mitigation (i.e. the two-track approach discussed previously), was essential in making the program work. The meeting was successful at gaining an initial appreciation for the need for multi-hazard mitigation; however, it was difficult for the communities to understand how the planning process would proceed without financial resources provided for planning. They felt that the "carrots" ought to be clearly defined, as should the potential funding sources for implementation. Recommendations supported the use of case studies and examples from other communities in developing mitigation strategies (Appendix 5).

Subsequent to this meeting, it became apparent that CRC/Sea Grant, along with RIEMA and the state committees, would be playing a key role in developing regional and local plans. Without the direct technical assistance of CRC, the local planning efforts could not be developed at this time.

The initial regional meeting in the Blackstone Valley was held in January 1996, and included a thorough discussion of mitigation with the local planners. This meeting

successfully introduced the process and began to build the interest necessary for follow-up action. A meeting similar to the October meeting in South County, which will bring together Department of Public Works, EMAs, and planners throughout the regions will take place on February 28, 1996 and will give the program more direction in this region.

Task I: Assist in the planning, and provide support for the second meeting of each regional council to select leadership. CRC has coordinated follow-up meetings in February and March, 1996 with the Blackstone and South County regions, respectively. These meetings will involve the development of local risk assessments. On March 21, 1996, the South County Region will have a half day, round-table workshop to develop risk assessments and identify initial mitigation strategies using tools developed by CRC to facilitate local input.

Task J: Work with regional council leadership to define their mission statement. Consensus was reached with the South County Working Group regarding their interest in working as a region to facilitate exchange between towns and within towns, and to learn about examples of hazard mitigation from other communities and other states. This task was done concurrently with the development of the roles and responsibilities for the State Hazard Mitigation Committee and the State Resource Committee. By developing the mission statements in tandem with the state level committees, we ensured linkages between the two levels.

Lessons Learned While Working at the Local Level

1. Regional leader. Someone within the region must be sought who has the ability to bring together the diverse people necessary to implement hazard mitigation. This person must be willing to lead the regional efforts and act as a spokesperson for the other towns in the regions.
2. Emphasis on mitigation not response and recovery. Most town officials have been trained to think in terms of response and recovery. Although this is a part of mitigation, it is only a part. Town leaders must be made aware of mitigation planning on a broader scale and the benefit to their towns of such planning.
3. Incentives. Towns must be clearly shown how hazard mitigation planning and implementation will help them. This can be discussed in the form of “carrots” (decreased insurance rates, funding, free technical assistance for a limited time) and “sticks” (if no plan, then no funding). Each town then must independently decide if it wants to participate and to what level. RIEMA must clearly define its policies regarding hazard mitigation planning and identify funding sources for planning and implementation. so that communities can make decisions how to address hazard mitigation. Additionally, FEMA’s regulations on the National Flood Insurance Program must be clearly understood by communities so that they can determine if additional requirements will be necessary and if additional funding will be allocated for mitigation initiatives.
4. Process. Even if a town decides that hazard mitigation planning is important. it might lack the capacity to participate. Therefore, the planning and implementation process must be simple and non-time consuming. Implementation is best achieved if management strategies are dovetailed with plans and regulations that eventually exist within the town’s operating structure. The process must be clear. Steps must be linked to tangible results and must not place additional pressure on the existing governance structure.

OTHER PROGRAM ELEMENTS COMPLETED THROUGH SEA GRANT FUNDING

Develop a State Strategy

The following elements have been completed by CRC over the past year with funding from Sea Grant, complementing the efforts of the RIEMA grant in developing a state strategy for multi-hazard mitigation.

Identify risks within the state to generate understanding of perceptions, risks, and mitigation opportunities. Looking at risks from a multi-hazard perspective is an approach whose time has come to Rhode Island. In the past, hurricanes and earthquakes, fire and floods have been looked at separately with planning, staffing, funding, and implementation initiatives compartmentalized by agency or type of risk. It continues to be a challenge to determine the most appropriate way to understand the various risks and to coordinate planning and implementation for a multi-hazard mitigation strategy in Rhode Island.

The first multi-hazard risk assessment work session was held with RIEMA's Hazard Mitigation Committee in January 1995, with state and federal agency participants representing different hazards (including hurricanes, earthquakes, snow storms) and various areas at risk (i.e. state parks, roads, public and private infrastructure, and communication networks). The participants emerged with a better understanding of the overall risks of the state and with a better sense of common goals to be achieved with a multi-hazard strategy. It became apparent, for instance, that the area at greatest risk from earthquakes—the coastal communities from Providence to South County—were also at high risk from storm flooding. Strategies developed in the next phase should focus on these two types of risks and build upon each other to make the most practical recommendations for implementing hazard mitigation. Because of the infrequency of earthquakes, it has been difficult for officials to understand the risks, and to implement strategies to reduce the potential damage. However, when considered along with the potential risks from floods, earthquake risks could be considered in appropriate mitigation methods. For instance, a recommendation that limits hazardous waste storage facilities in the high-hazard floodplains along the west side of Narragansett Bay would be beneficial for reducing risk of potential contamination of the Bay from structural failure during both earthquakes or flooding events.

Understanding all the risks of natural hazards throughout the state is important for determining specific planning initiatives within the communities (i.e. zoning or subdivision regulations) and for developing priorities (i.e. to improve infrastructure or to purchase shoreside property for conservation). Future efforts proposed by CRC/Sea Grant include developing a Geographic Information System (GIS) database linking specific risks, such as flood zones and fault lines, with existing/proposed development and infrastructure to understand the potential impacts resulting from natural disasters. This type of tool will be extremely useful for developing mitigation strategies that drive future decisions in Rhode Island.

Develop a hazard mitigation strategy that outlines the state's goals and policies, existing and future mitigation activities, and mechanisms for incorporating hazard mitigation into daily procedures. The foundation of such a strategy will be the local hazard mitigation strategies, goals, and initiatives. Efforts have been initiated by CRC/Sea Grant in analyzing existing state plans, policies, and programs that may be pertinent to hazard mitigation. CRC has developed a library of materials regarding existing state and local

policies, regulations and programs (see Appendix 6). From this baseline, additional methods can be developed to supplement ongoing hazard mitigation in other states and at the federal level.

Recommend a framework for receiving NFIP grants to **implement** flood hazard mitigation projects in regions that have **plans**, and to receive **planning** grants for other regions of the state. The work plan for this project has been developed to ensure that a draft state strategy will be completed in the fall of 1996. By this time, three regions (South County, Blackstone Valley, and Newport County-17 communities) will have completed local strategies. This puts the state in a good position to apply for funding for flood hazards mitigation through the National Flood Insurance Program, anticipated to be initiated in October 1996. Hopefully, grants can be used for flood hazard mitigation in those communities that have completed plans, and to contribute to the planning efforts in those communities that have not yet completed their multi-hazard plans.

Develop Local Pilot Projects

*The following elements have been completed by CRC over the past year with funding from Sea Grant, complementing the **efforts** of the RIEMA grant in developing a state strategy for multi-hazard mitigation.*

Identify risks, existing mitigation activities, and common perceptions of hazard mitigation.

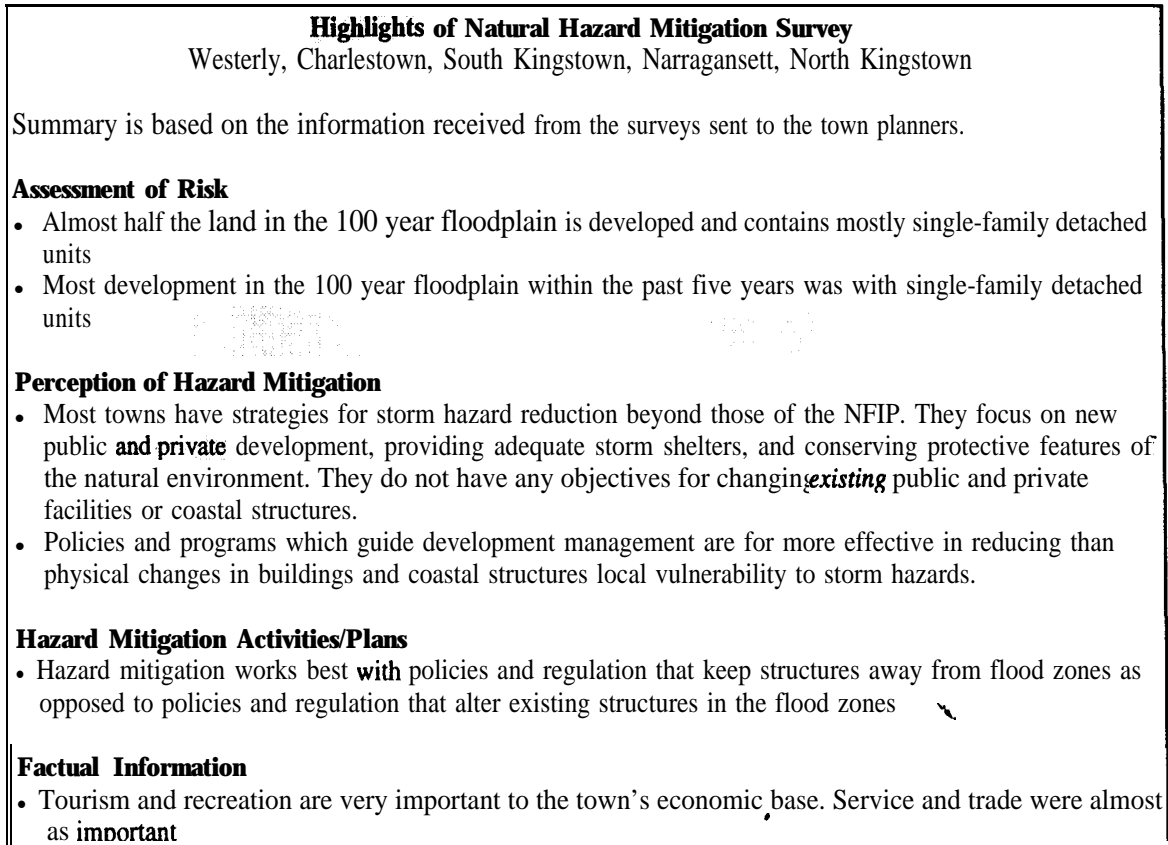
Risk Survey: Over the past year, several initiatives have been developed with the Sea Grant funding to address risks of natural disasters at the local level. Efforts produced a baseline understanding of the views of the community regarding risk and an evaluation of the existing mechanisms of planning and policy implementation from which the new strategy would be built. Basing its work on similar surveys from Connecticut and South Carolina, CRC developed a questionnaire for planners to assess risk, understand the perceptions of risk in local communities, and determine what ongoing activities that support hazard mitigation could be identified in the communities.

The survey (Appendix 7) was sent to planners in the five communities in the South County pilot project and is currently being conducted in the Blackstone River Corridor. Although it is difficult to develop trends based on only the five communities in South County, the surveys did provide some clear guidance on the existing situation, which will be extremely useful in developing local plans. Highlights from the survey are summarized in Figure 5.

Risk Matrix: The goal of the Hazard Mitigation Project is to develop community-based, multi-hazard mitigation plans, keeping in mind the limited resources at both the community and state levels. After evaluation of several methods, it was agreed by RIEMA and CRC that the philosophy *keep it simple* would be the most effective and appropriate way to complete the state's mitigation strategy. A similar philosophy is being used in Tennessee, where a simple, lo-page workbook, supplemented by workshops and technical assistance, has proven to be a relatively painless way to develop successful hazard mitigation plans throughout the state.

Undertaking local risk assessments can be a difficult task, involving many individuals and offices within the community. Information gathered from such risk assessments,

Figure 5. Highlights of the Survey



however, is critical in developing appropriate mitigation strategies for the community. CRC felt that a tool should be developed to assist in the gathering of risk information and that the tool should help facilitate the process by focusing on specific elements of importance. For instance, it is difficult for the town planner to answer the question "What is at risk in your community?" However, if the question were phrased "Which roads often flood during a nor'easter?" the planner could give specific answers based on past experience or knowledge of present situations. Furthermore, the results are made even more effective if the planner is given a local map with floodplains depicted, so that the he/she can circle the road on the map.

The risk matrix (Figure 6) developed by CRC has identified various potential risks that are likely to occur in Rhode Island communities. A group of local officials complete the matrix together, with appropriate maps available, so that the information is as should complete as possible. The second part of this tool is the mitigation strategy matrix (Figure 7), in which specific risks are analyzed to determine appropriate mitigation strategies on a case by case basis. It is important to note that any risk may have several mitigation strategies ranging from infrastructure improvement to management initiatives.

CRC intends to seek additional funds to computerize the risk matrix (Appendix 8 contains the proposal). This will assist communities in completing the matrix in their offices where a library of information and a broad expanse of expertise reside.

Figure 6. RISK ASSESSMENT AND IDENTIFICATION OF PRIORITY PROBLEMS

RISKS/TYPES OF PROJECTS***	LOCATION OF PROJECT (identify on accompanied map)	OWNERSHIP town/state/local	IDENTIFICATION OF PROBLEM	PRIMARY EFFECT	SECONDARY PROBLEM	FREQUENCY OF DAMAGE:	BENEFITS FROM MITIGATION PROJECT	RANKED PRIORITY Town's Priorities: 1 is highest priority and 10 is lowest
Infrastructure Improvements What roads are vulnerable to flooding during a storm? • Main Street	Coastal Community	State	low elevation and road flooding	flooding prevents safe evacuation	flood routes are not identified which creates a problem for tourists	hurricane, 100 year storm	safer evacuation	3

***Risks and Types of Projects continued. These will be incorporated into the matrix. What other types of questions would be appropriate to ask?

Infrastructure Improvements

- What roads are vulnerable to flooding/damage/undermining during a storm?
- What infrastructure is vulnerable to damage from storms, waves, erosion?
- What roads that are necessary for evacuation are vulnerable to flooding?
- What bridges are vulnerable to collapse from earthquake or undermining from floods?
- What piers, dams, seawalls are vulnerable to damage due to high flooding, or lack of maintenance?

Municipal Utilities

- What utilities are subject to damage from flooding?
- What utilities are subject to power loss without adequate backup power?
- Which utilities pose a potential for pollution because of power loss, damage to infrastructure?

Property Protection

- What areas are vulnerable to repeated damage from storms/hurricanes?
- What areas are vulnerable to damage from forest fires?
- Where does excessive erosion pose a potential danger to developed property?
- Which beaches are vulnerable to breaching and cause potential hazard to development?
- Which areas have a vulnerability to loss of historic structures from flooding/storm surge/wind damage?
- Which business districts are vulnerable to excessive damage from flooding/storm surge/wind damage?
- Which public buildings/properties/shelters are vulnerable to damage from storms/hurricanes/earthquakes?

Natural Environment

- What resources could be maintained preserved/enhanced to increase protection during natural disaster?
- What beaches are prone to erosion during winter nor'easters or hurricanes?
- Which beaches should be nourished with sand?
- Which local, state, or federal open space/parks are vulnerable to forest fire?
- Where would potential for forest fire pose a danger to human life or property?

Education and Awareness

- What information/programs would reduce vulnerability to residents in your community?
- What information/programs would reduce vulnerability to the business community?

Additionally, computerizing the questions and responses will aid in managing this valuable data, and will significantly increase the effectiveness for analyzing projects and priorities on a statewide level. Managing information for Rhode Island's 39 communities is an enormous task, where such tools **are** necessary for effective development of a state hazard mitigation strategy. Our colleagues in larger states would look to RI in envy of such few communities. However, even with the advantage of being the smallest state, this tool is necessary for us, and could assist mitigation officials tremendously in similar efforts to manage information obtained at the local level.

Develop a strategy for regions that will include a matrix of risks, mitigation activities, and prioritized actions. Plan should include an appendix of examples that have been successful in other communities as mitigation actions and implementation strategies. CRC/Sea Grant and RIEMA will be facilitating a round table workshop in March 1996 with the five South County pilot communities to initiate risk assessment through the use of these matrix tools. Planners, Emergency Management officials, building inspectors and other local officials will be encouraged to participate. In order to develop an appropriate assessment of risks and mitigation strategies, we will need the full participation from these officials, who will be working together at the workshop to develop their local strategy. CRC and the communities will then work with this information, and develop a list of implementation projects and mitigation strategies for the town. This will essentially be the town's hazard mitigation plan, to be presented to RIEMA and the State Hazard Mitigation Committee.

Identify planning and implementation activities related to flood hazard mitigation, so that communities can be prepared to receive NFIP grants for anticipated start in October 1996. Communities that have developed their matrices and their mitigation strategies could be eligible for funding through the NFIP grants for implementation of *flood hazard* mitigation activities. Those communities that have not completed their plans, could apply for grants to plan their flood **hazard** mitigation strategy, in part utilizing the tools developed here for multi-hazard mitigation.

Develop Network of Influential Individuals

Listed below are some activities accomplished over the past year that support Sea Grant funding allocations pertaining to evaluating the role of, and developing partnerships with, the private sector (including insurance, building, banking and real estate) and the Building Officials Code Association, to implement hazard mitigation and risk reduction initiatives.

Determine the role of the private sector, including insurance, building, banking; and real estate, and BOCA, to establish partnerships to implement hazard mitigation.

Understanding that hazard mitigation has many partners ranging from the homeowner and their building contractor, to the insurance industry and the government sponsored National Flood Insurance Program, CRC efforts have extended to include the private industry in Rhode Island's Hazard Mitigation Program. To date, the insurance industry, banking industry, and the building industry have participated in meetings and discussions about developing and implementing effective hazard mitigation programs in Rhode Island. As proposed, these industries are represented on the Hazard Mitigation Resources Committee so that their perspectives, knowledge, and expertise can be readily accessed, which is essential in developing the mitigation strategy. The insurance industry, through the Insurance Institute for Property Loss Reduction (IIPLR) has strongly supported damage research and has contributed to the data base of knowledge used by officials in

developing hazard mitigation techniques. It is the intent of RIEMA and CRC to fully engage these industries and continue discussions over the next few months to determine how effective partnerships can be created to make hazard mitigation mutually beneficial to all.

Coordination with Building Officials. Over the past six months, CRC has had discussions with the State Building Commissioner and his staff regarding hazard mitigation initiatives in Rhode Island. They have concurred that implementation and enforcement of the state building code is instrumental in effective hazard mitigation. Additionally, they have suggested that retrofitting existing structures will be a critical component of the RI strategy since only a small percentage of the structures built will be new. The Commissioner has shown extensive interest in developing a demonstration project in retrofitting existing structures. The State Hazard Mitigation Committee has shown interest in developing a demonstration project and may form a task force to work on this project.

Determine needs for training and public education to advance the implementation of hazard mitigation. Training for building inspectors will be key for successful implementation. There is an ongoing training program provided by the state for these officials. Additional training on hazard mitigation techniques could be incorporated into this existing program. Over the next year, CRC will investigate the feasibility of obtaining funding to develop a training program in conjunction with the State Building Commission. Additionally, the insurance industry is initiating the Building Code Effectiveness Grading Schedule program in Rhode Island early in 1996. This program will be evaluating the effectiveness of how local building codes are enforced with special emphasis on mitigating losses from natural hazards. CRC has had initial discussions with the Insurance Services Office, the company conducting the community surveys to determine an appropriate way to coordinate efforts.

Influence National Policy and Program Development

CRC/Sea Grant activities have been designed to include elements that support overall growth in National policy and program development.

Communicate with other Sea Grant Programs. Ongoing discussions with other Sea Grant programs have occurred over the past year. In December 1995, a meeting was held with Rhode Island, North Carolina, and South Carolina Sea Grant representatives to discuss ways that programs can coordinate with each other and further the goals of Sea Grant in hazard mitigation. There was concurrence that the programs work independently, and develop a portfolio of current activities to promote information exchange between states. Efforts have been initiated to develop a hazard mitigation news group over the Internet to facilitate communication among the Sea Grant programs working in this subject. There are several areas where Sea Grant programs could be useful, which should be considered by individual programs, including public education, bridging research and policy. and in disseminating information generated by the demonstration project, Blue Sky, in North Carolina.

CRC believes that the various state and national Sea Grant activities should try to fill a niche in hazard mitigation by concentrating on specific areas partnerships between state CZM programs and EMA programs, enhancement of natural resources (i.e. dunes, marshes) as a means of hazard mitigation, and in developing public-private partnerships with the insurance industry, building industry, and local officials for implementing

hazard mitigation programs. Over the next year, CRC will evaluate ways to address these issues in partnership with other Sea Grant Programs.

Participate in workshops and conferences. Over the past year, CRC has participated in workshops and conferences, both as participants and as speakers, highlighting the Rhode Island example of community-based statewide hazard mitigation planning. Most recently, both CRC and RIEMA staff participated in the First National Biennial Mitigation Conference, ***Partnerships for Building Safer Communities***. This conference was extremely useful in determining what efforts are ongoing in hazard mitigation (i.e. regarding the National Flood Insurance Program, insurance industry, and building industry), and in educating ourselves on approaches of developing hazard mitigation plans in other states.

In September 1995, The University of Vermont co-sponsored an informative two-day workshop entitled ***Preparing our Communities for Changes in Disaster Assistance***. The broad participation from local, state, and federal governments provided excellent resources for developing multi-hazard mitigation plans. CRC coordinated and facilitated the discussion ***Partnering for Statewide Mitigation Planning: A Successful Rhode Island and Massachusetts Model***. Jim Pepper, executive director of the Blackstone River Valley National Heritage Corridor, spoke about their successes in partnering with the various communities and stakeholders in the Corridor. The Blackstone's experiences highlighted the need to find a common purpose among partners and develop a common vision and a sense of place; encouraged the formation of multi-objective and multi-agency partnerships; pointed out that shared visions insure that all partners have a stake in decision-making; and that partners must be willing to give away some power in order to get benefits from partnerships. Michelle Steinberg from the Massachusetts Department of Environmental Management presented their approach in developing a handbook with the town of Marshfield, which would provide a model framework for communities in developing hazard mitigation plans. Massachusetts is in the process of reviewing their draft workbook at this time, which will be an extremely useful resource for the RI Hazard Mitigation Planning effort. Pam Rubinoff of CRC spoke about the Rhode Island community-based strategy and the need to work simultaneously with local and state officials in developing state policy. Following the panel presentation, CRC facilitated a lively and interesting discussion on sustainable partnering and mitigation incentives. From the feedback received, the session was successful and thought provoking, and has been useful in developing our community-based plans in Rhode Island.

Rhode Island will host the annual meeting of the Building Code Officials Association (BOCA) in September, 1996. CRC believes that this would be an excellent opportunity to reach these officials and begin to develop a partnership nationwide with building officials. The Commissioner, who is the President of BOCA this year, concurred. CRC's recommendations include developing a panel discussion on hazard mitigation, together with some sessions on practical solutions involving the building industry.

Conclusion

Over the past year the efforts of RIEMA, the Hazard Mitigation Committee, the Resource Committee and the Working Groups in South County and the Blackstone River Valley have laid a foundation for developing a state hazard mitigation strategy and reducing future losses resulting from natural disasters. Through its technical assistance role, CRC/Sea Grant has worked with these dedicated individuals, facilitated discussions and made recommendations that have been implemented. This foundation is only the first

step, upon which the state's hazard mitigation program will be built. Local and state agencies will need to commit resources for developing this strategy, with the technical assistance of RIEMA, CRC/Sea Grant and the Hazard Mitigation Committee.

Concurrently, it will be necessary to establish a framework for implementation of policies, mitigation projects, and *proactive* strategies to insure that the loss to the communities and the people of Rhode Island is significantly reduced when the next disaster occurs. CRC/Sea Grant will continue working with RIEMA and the various federal, state, local and private industry interests through 1999 to develop a program for Rhode Island and a model of *community-based, multi-hazard mitigation planning* for other states and local communities.

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RIEMA Grant Proposal (19954996)

Project Methods and Project Work Schedule:

1. Enhance the state Hazard Mitigation Committee

Task A: Evaluate existing strengths and weaknesses of existing state hazard mitigation council and identify current goals and objectives. Conduct a 1/2 day workshop for the members of the existing Hazard Mitigation Committee. At the workshop, the council members, using a participatory learning approach, will identify the committee's strengths and weaknesses (i.e. what other agencies need to be represented on committee). The council will also define preliminary statewide hazard mitigation goals and objectives.

Month of Project: 2 & 3
Time to complete task: .25 month
Project Staff: Amaral, Lee, Pogue

Task B: Assess state hazard mitigation council needs. Based on the workshop, the needs of the council will be assessed and reported. After review by the council and in consultation with RIEMA and FEMA advisors, the additional members required to enhance the council will be identified. This will likely include the identification and selection of additional council members.

Month of Project: 3 & 4
Time to complete task: .5 month
Project Staff: Amaral, Lee, Pogue

Task C: Establish a commitment by key agencies to participate on state Hazard Mitigation Committee. To ensure inter-agency cooperation, Memorandums between key state agencies and RIEMA that express a willingness to actively participate in statewide hazard mitigation activities will be sought. This will include securing a commitment from agency representatives who have been selected to join the state Hazard Mitigation Committee.

Month of Project: 5 & 6
Time to complete task: .25 month
Project Staff: Amaral, Lee, Pogue

Task D: Conduct working session(s)/retreat to establish goals, objectives, and operational procedures for state hazard mitigation. Once the new council is established, a second 1/2 workshop will be conducted. The enhanced council will receive a general introduction to hazard mitigation, and using a participatory approach, articulate goals, objectives and operating procedures for itself. The council will revisit and revise, if necessary the preliminary goal for statewide hazard mitigation. Additional workshops on topics such as building code standards and enforcement will be conducted if necessary. Hazard Mitigation Committee will identify future tasks that include conducted workshops or building codes.

Month of Project: 8
Time to complete task: .5 month
Project Staff: Amaral, Lee, Pogue, intern

2. Create five hazard mitigation councils organized by country within RI.

Task E: Identify all local Emergency Management Agency directors and other appropriate local officials. RIEMA's existing database will be used as a foundation for this task. The local needs assessment process will also be utilized when possible to update and collect additional information.

Month of Project: 3, 4 & 5
Time to complete task: .25 month
Project Staff: Amaral, intern

Task F: Maintain an accurate listing of Emergency Management Agency directors and other appropriate local officials. From the data collected about the local emergency management agency directors and other appropriate local officials, an active database will be created and maintained at CRC. The data will also be provided to RIEMA, FEMA and municipalities.

Month of Project: 5-end of project
Time to complete task: .1 month
Project Staff: Amaral, intern

Task G: Establish regional working groups. Using the information collected in tasks F & G, individuals will be contacted and asked to serve on a regional hazard mitigation council. Five regional hazard mitigation councils will be established. If it is appropriate, the councils will be organized by county. Council members will include local emergency response officers, town managers, town planners, police and fire chiefs, harbor masters and other relevant local officials. One member of each regional council will be selected by his or her peers to serve on the state hazard mitigation committee as an ad hoc member. The council's will serve as a conduit for planning action and information to move between the local and state level.

Month of Project: 5, 6 & 7
Time to complete task: .75 month
Project Staff: Amaral, Lee, Pogue

Task H: Assist in the planning, and provide support for the first meeting of each regional council. Direct support will be given to each council as the originating members organize and conduct the first meeting. Although the specific agenda for the first meeting will be finalized by the participating individuals, it is anticipated that the first meeting will serve as an introduction to hazard mitigation, the statewide hazard mitigation process and the potential role the council could serve.

Month of Project: 8 & 9
Time to complete task: .75 month
Project Staff: Amaral, Lee, Pogue, intern

Task I: Assist in the planning, and provide support for the second meeting of each regional council to select leadership. Once individuals who are interested in serving on the each regional council have been selected, a second meeting will be conducted. This meeting, using a facilitated process, will select council leadership and draft operational procedures, goals and objectives.

Month of Project: 9, 10 & 11
Time to complete task: .5 month
Project Staff: Amaral, Lee, Pogue, intern

Task J: Work with regional council leadership to define their mission statement. Working with the leaders of each regional council and using the draft created at the second meeting, a final mission statement will be completed. The mission statement will include goals, objectives and operational procedures. Once completed, it will be distributed to each regional council and the state Hazard Mitigation Committee.

Month of Project: 11 & 12
Time to complete task: .5 month
Project Staff: Amaral, Lee, Pogue

3. Prepare a final report

Task K: Prepare a final report for RIEMA/FEMA. The final report will outline the process utilized to complete the previous tasks. This report will provide a model and standards that can be used in other states to develop a state hazard mitigation council and regional hazard mitigation councils.

Month of Project: 12 & 13
Time to complete task: .5 month
Project Staff: Amaral, Lee, Pogue

Products

- Expanded state hazard mitigation committee with clearly articulated purpose and procedures.
- Regional hazard mitigation councils that represent local hazard mitigation interests and facilitate information exchange among local communities and the state and among communities.
- A network of local individuals who actively participate in mitigating hazards at the community level.
- Report documenting the steps taken to institute state hazard mitigation council and establish local hazard mitigation council so that the process can be replicated.

Appendix 2

Sea Grant Proposal

PROTECTION OF LIFE AND PROPERTY Planning for Natural Hazard Risk Reduction

Situation

Rhode Island is a small, highly urbanized state with an extensive developed coastline. Between 1980 and 1988, coastal property values increased 60 percent, from \$32 million to \$53 million (Flesner, 1989). Much of this development is vulnerable to coastal flooding and storm surge destruction.

Recent experience has shown that major coastal hurricanes are extremely costly. Hurricane Bob, which struck New England in 1991, caused over \$60 million in marine losses alone, while total damage costs from Hurricane Andrew exceeded \$1.9 billion (FEMA 1992, 1993). According to national hurricane experts, future storm events are likely to occur more often and with more intensity. These storms will have a severe impact on the local economy.

Earthquakes and fires on the west coast, floods and tornadoes in the **midwest**, and hurricanes in the southeast, have shown the new leadership at the Federal Emergency Management Agency (FEMA) that their traditional mode of responding after disasters occur is not financially feasible in the long run. FEMA has realized that steps must be taken to limit exposure to natural disasters before they occur. Local communities must plan ahead for disasters by limiting unsuitable development in high risk areas, and by requiring that development meet standards that can withstand storm, flood and earthquake impacts. These steps will not prevent natural **disasters**, but they will reduce their economic and social costs. RI Sea Grant CRC would like to help FEMA implement this forward thinking risk reduction strategy in Rhode Island, so that it serves as a model for New England and the nation.

Problem and Opportunity

FEMA, under the leadership of a new director, has a new view of hazard mitigation as a centerpiece to all preparedness, response and recovery activities. The Stafford Act has recently been revised to require states to develop plans to reduce the potential impacts of multiple hazards. However, this hazard mitigation planning process is in its formative stages; state and local emergency management officials are finding it difficult to conceptualize and apply.

In a coastal state like Rhode Island, useful disaster preparedness plans must be developed with full cooperation between the emergency management agency and the existing network of institutions responsible for coastal management at the state and local level. This will be a major challenge for the Rhode Island Emergency Management Agency (**RIEMA**) which has traditionally kept itself apart from other state agencies involved in coastal management. Moreover, natural hazard risk reduction will require the support of local citizens and officials and a new working relationship between municipalities, state and regional government. Forward planning for natural disasters requires new levels of integrated thinking and policy formulation. RIEMA and the local officials they work with need assistance and guidance to make the process as productive and useful as possible.

Previous Objectives

Our previous proposal contained an **element** to formulate a prototype policy guidance to incorporate disaster planning into municipal harbor management plans. The objectives stated in the **proposal were:**

- (1) Reduce damage to boats and harbors through harbor planning and management for emergency preparedness.
- (2) Develop a model hazard mitigation plan that can be adopted in local harbor management plans and in the state of Rhode Island coastal management regulatory framework.
- (3) Provide the State of Rhode Island's Coastal Resources Management Council (CRMC) with the basic criteria on which local hurricane preparedness plans can be approved.

Accomplishments

This is another step in our long-term strategy to build capacity for local government to coordinate with state government and participate in coastal management. It began with Sea Grant funding the development of a model harbor management planning process and prototypes that were formally adopted by CRMC in 1990. This was followed by a harbormaster training program to build local capacity to administer the harbor plans.

With funding from RIEMA, Sea Grant CRC developed a model for disaster preparedness as an additional element of the harbor management planning guidance promulgated by the CRMC. Moreover, guidance for individual actions to mitigate risks in the event of a hurricane was also developed for marina operators, our primary coastal businesses. In addition:

- A fact sheet on hurricane hazards was prepared and distributed to boaters and harbormasters state-wide.
- Technical assistance was provided to Massachusetts harbormasters to improve local mooring standards.
- A model hazard mitigation plan was developed for **Wickford Harbor** in cooperation with CRMC, the local community and state harbormasters, and is currently in review for adoption.

CRC Sea Grant has previously worked with state agencies and towns on a series of projects to reduce the threats from natural disasters. Past projects have included: working with research faculty to measure shoreline erosion and winter storm impacts on beach profiles; recommendations for mitigating hurricane impacts on RI salt ponds; and developing coastal management plans which safeguard populations from natural disasters. CRC has also worked cooperatively with FEMA as a member of both the state Hazard Mitigation Team and the Northeast Regional Interagency Task Force to identify projects that will improve the level of hazard mitigation throughout the northeast.

New Objectives

- (1) Develop statewide management policies and procedures for protecting life and property from coastal hazards.
- (2) Increase local government's awareness of threats from natural disasters and their ability to respond proactively to coastal storms and flooding.
- (3) Demonstrate a model interagency process for developing local hazard mitigation plans that improve coordination and increase communication between RIEMA and other coastal management agencies in Rhode Island and coastal municipalities.
- (4) Promote regional and national learning about hazard mitigation by exchanging ideas among federal, state and local hazard mitigation experts and Sea Grant Programs.

Activities

The long-term goal of Sea Grant CRC's disaster preparedness project is to reduce the costs of natural disasters in Rhode Island through developing and implementing a statewide disaster preparedness strategy. To do this we will work with RIEMA and other state agencies to develop a statewide approach to minimizing the affects of natural disasters. Simultaneously, CRC will guide local communities in developing local plans to reduce the costs of natural disasters.

CRC will work closely with RI's Hazard Mitigation Committee to formulate a strategy and establish priorities for statewide disaster preparedness planning. The final direction for the project and strategic plan will be established under the direction of this planning group. The project will entail four major components: research, strategy development, statewide implementation, and national and regional networking.

Research (FY 96)

- ***Assess Current Status of RI Towns' Risks to Hazards and Opportunities for Mitigation.*** Information will be collected about: zoning ordinances designed to protect citizens from building in high hazard areas; overlaps and inconsistencies between town ordinances; town officials' perceptions (building inspector, fire chiefs, emergency management officers, police) about opportunities for natural hazard mitigation.

- *Evaluate the Insurance Industries and Building Officials Code Associations Role in Disaster Preparedness:* Information will be collected about how insurance agencies interact with town management, insurance underwriters perception of local risk, and assess town liability and how building code officials influence mitigating local risk. We will work with the Building Code of America officials (BOCA) as they review Rhode Island communities in 1995-96 to assess community liability and to explore the role of BOCA in better implementation of hazard mitigation at the local level.
The findings from this research will be summarized in a paper about attitudes towards natural disasters in Rhode Island and opportunities for risk reduction..
- *Communicate With Other Sea Grant Programs.* Keep abreast of hazard reduction activities in other Sea Grant programs. Share information and techniques. Conduct a workshop to identify proactive hazard mitigation actions.

Strategy Development (FY 96 - FY 98): Assist RIEMA in developing a statewide strategy for disaster preparedness that local communities can use as a guide to develop local disaster preparedness plans. Once draft guidelines are established, they will be tested in two local communities for practicability and usefulness before being formally adopted statewide.

- *State Policy Development.* Working with the state hazard mitigation committee, CRC will guide a planning process. The planning process will:
 - (1) Establish state policy that guides municipalities in developing hazard mitigation plans.
 - (2) Establish a database of case studies of effective local and state government mitigation strategies elsewhere in the country and apply, as appropriate, to Rhode Island.
 - (3) Begin to integrate hazard mitigation planning into the regular activities of state agencies.

Options to ensure the implementation of the state strategy may include a legislative mandate, signed memoranda of agreement among state agencies, executive order or other appropriate means.

- *Local Pilot Projects.* The successful implementation of disaster preparedness in Rhode Island will depend upon close coordination between several state agencies and a variety of town officials. A wide range of policies and regulations need to be addressed and public opinion must support a proactive approach to disaster planning. CRC will initiate a local planning process in two coastal communities to develop model local hazard mitigation plans. To ensure that the model plans apply to both cities and towns, the two pilot sites will represent different types of communities: urban and suburban.

Statewide Implementation (FY 98 - FY 99): Supplemental funding has been requested from RIEMA for this phase of the project. The RIEMA funding will be devoted to developing a state hazard mitigation team and regional hazard mitigation councils. Sea Grant funding will be dedicated to background research and developing the statewide strategy and model local plans. During this phase of the project, CRC will actively explore opportunities for working with private insurance companies and building code officials to achieve successful implementation.

Networking (FY 96 - 99)

- **National Task Force (FY 96 - FY 99).** CRC has been invited to participate on the National Hazard Mitigation Planning Task Force being formed by FEMA. This task force is charged with developing new federal guidelines to assist states in hazard mitigation planning efforts. The process being applied in Rhode Island can serve as a model for the task force to consider while developing a national approach to hazard mitigation.

- **National Conference (FY 97).** In cooperation with South Carolina and Oregon Sea Grant programs, RI Sea Grant CRC will participate in a national conference on natural hazards. The purpose of this conference is to share information among Sea Grant programs, federal, state and local agencies, private insurance companies and other related groups, about minimizing the effects of natural disasters. The conference will highlight the ongoing Sea Grant projects in the Northeast, Southeast and Northwest regions of the US.

- **Regional Workshop (FY 98).** CRC will conduct a regional workshop that focuses on hazard mitigation planning in the Northeast. The audience will be state and local hazard mitigation officers, building code officials, local and state planners, town and city managers, and other appropriate stakeholders. The purposes of the workshop are to:
 - (1) Exchange information among states about hazard mitigation activities.
 - (2) Provide FEMA with input on proposed national hazard mitigation planning guidance.
 - (3) Bring expertise from other Sea Grant programs such as North and South Carolina to the northeast to share the experience they have developed in risk assessment, construction codes, and post-disaster strategies.This workshop will occur during Year Three. This provides time for Rhode Island to develop an experience worthy of sharing and enough time remaining in the project to react to suggestions and new ideas.

- Publication of the model process for hazard mitigation (FY99).

Collaborators

Federal Emergency Management Agency, National Office (Terry Baker)
Federal Emergency Management Agency, Region I (Paul White)
RI Emergency Management Agency (Joe Almeida)
State Hazard Mitigation Team (Dept. of Envir. Mgmt, Dept. of Transportation, Dept. of Planning)
RI State Building Commissioner and Building Code of America, President (J. Cirrilo)
Local communities (Town managers, Police and Fire Chiefs, Planners, Building Officers, Emergency Management Officers, Harbormasters)
American Planning Association (Cecilia Rosenberg)
Sea Grant Programs (Roger Spencer - N.C., Bob Bacon - SC, Jim Good - Oregon)

Products

- (1) An issue-driven needs assessment for five coastal model communities in Rhode Island.
- (2) A technical report on the concepts, methods and tools being used elsewhere in the US for hazard mitigation as they relate to the RI context for distribution to state agencies and FEMA (regional and national offices).
- (3) Model municipal hazard mitigation plans for two coastal communities that can be adopted by each of the RI coastal municipalities (in cooperation with RIEMA, CRMC, DEM).
- (4) Regional workshop to review and discuss federal guidelines for hazard mitigation planning.
- (5) Participation in a national Sea Grant conference on natural hazards.

Milestones/Evaluation Criteria

- (1) Improved local municipal awareness of risk to multi-hazards that may affect Rhode Island. This is measurable by:
 - Surveying the membership of regional hazard mitigation councils to identify what is at risk locally. This survey will be conducted at the beginning of FY 95 and again at the end of FY 98 to measure changes in local awareness.

- Written assessments of local hazard mitigation needs prepared by local towns.
- (2) A clearer sense of what actions will be needed at the local level to mitigate local risk. This is measurable by:
 - Surveying the membership of regional hazard mitigation councils to identify what are the appropriate actions to mitigate local risk. This survey will be conducted at the beginning of FY 95 and again at the end of FY 98 to measure changes in local awareness.
 - (3) Development of a statewide strategy for mitigation of natural disasters by 1997. This strategy will be successful if it:
 - Incorporates input from local and state agencies that play a role in disaster preparedness and recovery.
 - Provides a framework for interaction among state agencies to minimize the effects of natural disasters through preparedness planning and mitigation activities.
 - Gives local governments useful guidance for developing local hazard mitigation plans.
 - (4) Development of two model hazard mitigation plans for local towns and cities that conform with state hazard mitigation strategy by 1997. These plans will install a management structure responsible for safeguarding both public and private assets that amount to millions of dollars in real estate and property.
 - (5) Using technical assistance and outreach, provide the model plans to other Rhode Island communities by 1999.
 - (6) Completion of a regional workshop by -1997. The workshop will be successful if:
 - The outputs from it are used to influence hazard mitigation guidance in the northeast.
 - State hazard mitigation officers and other key state and local officials use the opportunity to share individual experience.
 - (7) Completion of a national workshop in cooperation with South Carolina and Oregon Sea Grant by 1997.
 - (8) Experience gained during this process is used while developing new national hazard mitigation guidance by FEMA.

Effort

Sea Grant is funding 0.4 FTE MAS staff 0.2 FTE administrative and 0.25 FTE graduate student hourly for four years.

Match is providing 0.1 FTE CRC staff

RIEMA funding = 0.7 FIE for four years

Total = 1.6 FTE for four years.

Appendix 3

Hazard Mitigation Resources Committee State Agencies and Private Sector Interests Opportunities for Partnership in Rhode Island November 7, 1995 - Meeting Notes

Attendance

• Fifty participants attended from federal and state agencies, local communities and the private sector (See Attendance sheet) Richard Moore, associate director of FEMA opened the event including. Local officials included police and fire chiefs, town managers, **EMAs**, and DPW directors. From the private sector there were several interest groups which included building and insurance industry.

Goals of the Meeting:

- Inform communities of the changes in our nation's disaster relief policies
- Identify the role and opportunities for coordination of hazard mitigation activities among state and local governments and the private sector.
- Develop a common vision of how to pursue hazard mitigation for the State of Rhode Island.

Summary

Federal Trends in Disaster Relief

• With severe weather trends expected to persist, and with vulnerable coastal areas increasingly populated and developed, the exposure of life and property to disaster is growing exponentially. Given the exorbitant cost of disaster recovery-more than \$34 billion in federal relief alone between 1989 and 1994-emergency management officials are looking to mitigation as the best hope for disaster management

Mitigation in Rhode Island

- In Rhode Island the increase in value of coastal uninsured property creates a significant increase in vulnerability. Anywhere from 80,000 to 100,000 people in the state are at a risk of inundation during a fast-moving storm. Hurricane Bob, the last major storm to affect Rhode Island, caused an estimated \$106 million in insured losses and left 60 percent of the state without power.
- Rhode Island is taking the first steps towards a statewide plan for hazard mitigation through a series of meetings and workshops, coordinating the resources of state, local and federal agencies as well as the private sector. With technical assistance from the Rhode Island Emergency Management Agency and the University of Rhode Island Coastal Resources Center/Rhode Island Sea Grant, emergency management agents, municipal and public work officials, insurance and building trade representatives, environmental officers and others with a role in hazard mitigation are mapping a strategy for reducing losses from natural disasters.
- Rhode Island's efforts build on the national Hazard Mitigation Strategy signed by President Clinton last fall. The national strategy emphasizes active partnerships among all levels of government and the private sector to reduce or eliminate risk over the long term. FEMA endorsed this approach as a more effective strategy than strict emergency response to, or even immediate short-term preparedness for, a specific event.

Local Role

• The process of hazard mitigation begins at the local level: communities have to adopt and enforce land use and building code policies and minimize risk of loss, and individuals have to take responsibility for reducing risk to their own properties. Before individuals will accept their role in hazard mitigation, they have to recognize their vulnerability to hazards, the real costs of natural disasters, and the means available for reducing their impacts.

Identification of risks

- Risks include the potential damage to exposed coastal and riverine populations, structures and critical facilities. In looking at risks, consideration should be given to acknowledging increased loss from development and the local reaction to vast damages to life and private property.
- The majority of damages are likely to occur from events that include coastal flooding, river overflow, wind damage (Nor'easters and hurricanes) and erosion of coastal beaches.

Mitigation Strategies for Rhode Island

Participants suggested mitigation activities that included enforcement of construction standards, building codes and zoning ordinances as mandates rather than merely “guidance” along with standardization of mitigation regulations throughout the state. They also emphasized the role of education, recommending exposure to hazard mitigation strategies for builders, architects, building inspectors, etc., and inclusion of information about building codes and mitigation techniques in college courses for engineers and architects. Other recommendations included:

- Developing programs to enhance public awareness and understanding of risks.
- Implementing better building mandates and practices for hazard reduction,
- Training local officials to implement hazard mitigation practices.
- Insuring reasonable escape routes.
- Infrastructure maintenance: dune restoration and rehabilitation, pre-trimming tree limbs vs. underground utilities, water retention areas for drainage control, marine vessel evacuation procedure and coastal access.
- Redefinition of zoning to reduce construction in high risk areas and implement smart building practices (i.e. do not locate roads/bridges in erosion-prone areas).

Recommendations regarding coordination and implementation of hazard mitigation activities

- RI/Federal Partnership - The five year Performance Partnership Agreement signed by Governor Almond with FEMA clearly states the commitments of RI to mitigation.
- Mandates vs. voluntary action - Encourage the involvement of insurance and building industries in developing incentives and public-private partnerships.
- State Hazard Mitigation Committee - Fully engage the committee to oversee mitigation opportunities and implementation of state hazard mitigation plan.
- Standardize regulations - Encourage consistency among municipalities in mitigation strategies and regulations.
- Public Utilities - Ensure that power is restored to essential locations for expedient mitigation.
- Emergency building permits during the aftermath of a natural event should be coordinated between the Coastal Resource Management Council, RI Emergency Management Agency and the RI Building Commission, so that poor building practices are not repeated and that mitigation strategies are implemented.

Resolution:

The group agreed to meet annually or biannually to provide input to the RI Emergency Management Agency and the state Hazard Mitigation Team on implementation of local and state hazard mitigation strategies and associated programs.

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Appendix 4

**Hazard Mitigation in Rhode Island
Implementation Framework
Purpose and Procedures**

Overall goal

The overall goal of the organizations that form the State’s hazard mitigation implementation framework is to:

Reduce the loss of life and property from natural disasters by implementing pre- and post-disaster mitigation strategies.

Hazard **Mitigation** is defined by FEMA as sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects.

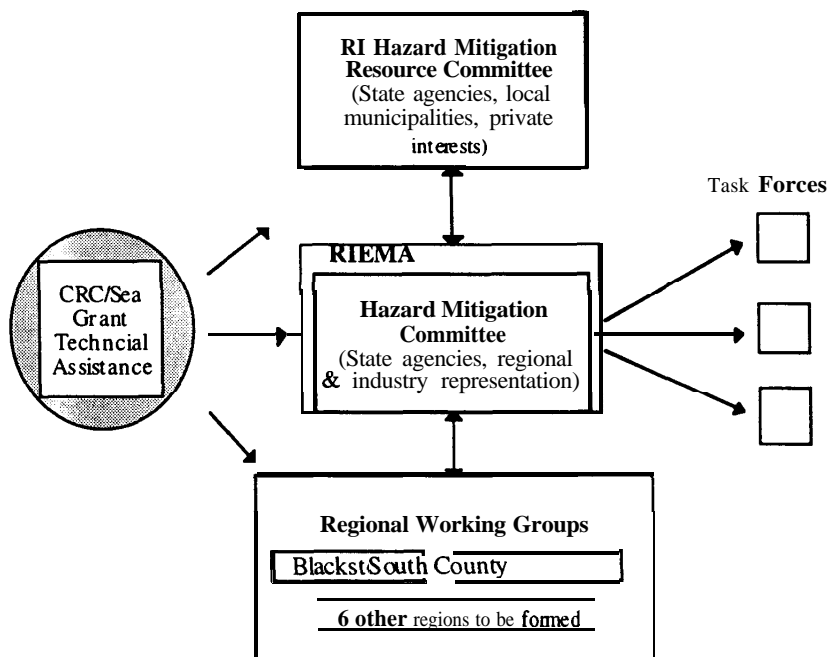
Structure

The implementation framework is developed to facilitate coordination and integration among and between:

- state agencies
- local jurisdictions
- state agencies and local jurisdictions
- public and private sectors, especially insurance companies, builders and financial institutions.

To achieve this, the implementation framework has four organization (shown below), linking state agencies, private interests and local jurisdictions;:

Implementation Framework



Purpose and procedures of each organization:

1. Rhode Island Hazard Mitigation Resource Committee

Purpose: The Resource Committee will:

- annually review the state's hazard mitigation plan and policies
- provide advice to RIEMA during the implementation of the plan
- assist RIEMA set annual Performance Partnership Agreement (PPA) objectives as they relate to hazard mitigation
- serve as the primary mechanism for integrating mitigation activities among state agencies and between public and private sector

Membership: Representatives from federal and state agencies, local jurisdictions and private interests.

Operation: Committee is chaired and managed by RIEMA. The Resource Committee will meet at least once annually. In preparation for this meeting, RIEMA will distribute an annual update to each member highlighting the year's activities and proposed hazard mitigation objectives for the following year prepared for the PPA. The annual meeting will be combined with an update from FEMA regarding current programmatic changes at the Federal level.

Short-term Actions

- Finalize participation of the members on the Committee, review its purpose and procedures and establish a 1996 agenda of activities.
- Review and update existing MOU/SOP between RIEMA and state agencies to include hazard mitigation activities.

2. Rhode Island Hazard Mitigation Committee

Purpose: This committee will develop and implement a revised state 409 hazard mitigation plan. This will require the committee to:

- complete a statewide risk and vulnerability assessment;
- set statewide goals, objectives and policies for proactive mitigation at the state and local levels that can be used for the allocation of federal and state resources;
- inventory existing mitigation measures currently being implemented at state and local levels; and,
- develop strategies for mitigating risks, including those risks that specifically affect state owned properties and real-estate.

The committee will serve as the State's primary organization to revise the plan annually, evaluate the impact of the state's mitigation program and make recommendations to RIEMA for improving the program's effectiveness. These recommendations will be included in RIEMA's annual update to the Resource Committee.

This will be a working committee, with work and responsibilities that continue outside of meetings. It is expected that committee members will be given the authority and flexibility by their organization to complete these tasks as part of their job responsibilities. Members should strive to incorporate appropriate hazard mitigation strategies, as selected through the planning process, into their agencies policies, programs and operating procedures.

The committee also has the responsibility for allocating Section 404 funds from the Stafford Act and other mitigation funding as it is made available according to the goals and policies of the state hazard mitigation plan and requirements of the Act.

In completing these responsibilities, the committee will coordinate between and among local, state and federal government as well as with private interests. It will also assist RIEMA to achieve the objectives as set fourth in the Agency's PPA.

Membership: current committee as established by RIEMA with the addition of a representative from CRMC, South County Community, Blackstone River Corridor Community, Insurance industry and the Builders Association. Each agency and organization will maintain its appointment with a representative. Members are required to attend and participate in committee meetings and provide the link between the agency they are representing and the state Hazard Mitigation Committee.

Organization: The Committee is chaired by **RIEMA's** Governor's Authorized Representative, managed with technical and administrative support provided by RIEMA. The committee will meet at least quarterly, or more frequently to complete its responsibilities.

Short-term Action (0-6 months) the committee will:

- confirm new members
- HMPG review
- finalize organization of:
 - State Resource Committee (agreement by individuals to serve)
 - State Hazard Mitigation Committee
 - Demonstration Project Task Forces (linked to demonstration projects)
- Regional working groups
- review and revise the State and Local Hazard Mitigation Strategies
- select at least one demonstration project and organize the implementing task force
- review and update existing **MOU/SOP** between RIEMA and state agencies to include hazard mitigation activities

3. Mitigation Task Forces

Purpose: To test and evaluate mitigation activities through implementation of research, policy setting, training and education activities.

Membership: Task forces will be established by the committee as specific needs arise. Members will include those people necessary for carrying out the activity.

Operation: Each task force will select a task leader who is responsible for oversight of the activity and reporting progress to the committee. Ideally, the task leader will be a member of the Hazard Mitigation Committee. RIEMA will provide administrative and technical support to the task forces. Once the activity is complete. the task force will be dissolved.

Short-term Action (0-6 months): Identify demonstration projects from the list of activities outlined in the draft state strategy for which task forces could be established. The objective of the demonstration activities is to develop a few well designed projects that:

- promote participation in the project
- build constituencies within the project
- can be executed in the January to August time frame

- test the feasibility of specific actions that promote integrated and sustainable hazard mitigation
- enhance state and local structures and capacity for participating in the planning and implementation process

Selection Criteria:

1. project strengthens the contribution or involvement of key stakeholders in the process
2. community as a whole benefits
3. well thought out **workplan** exists
4. raises the awareness of hazard mitigation
5. involves the non-governmental and private sector in hazard mitigation
6. tangible results can be measured within a specified amount of time
7. project is clearly linked to priority risks, based on the state's most recent risk assessment

4. Regional working groups

Purpose: The Regional Working Groups will:

- identify and address regional hazard mitigation priorities;
- address hazard mitigation issues that exist on a regional scale to minimize overlap and incongruencies between and among communities;
- provide a forum to exchange information and ideas among towns and between local officials critical to the implementation of hazard mitigation;
- select a representative from the region to serve on the state Hazard Mitigation Committee; and,
- provide an efficient mechanism to call together the key mitigation experts from the local governments within a region for the purpose of education and training.

Membership: The council will include town managers, planners (and/or representative from planning board), **EMA** officers, building inspectors, and police and fire chiefs from each community within the region. Each of these people will play an important role in their community during the implementation of a local hazard mitigation strategy. Members should strive to incorporate appropriate hazard mitigation strategies, as selected through the planning process, into existing municipal policies, programs and operating procedures.

Organization: The councils will be ad-hoc and will not require a formal chair or secretariat. RIEMA will provide technical and administrative support to the regional working groups. They will convene on an as needed basis to address a regional or inter-boundary issue or select a new representative to the state Hazard Mitigation Committee. Meetings can be called by any of the members or RIEMA. Members of the state committee will be available to provide technical assistance to the councils.

Short-term Action (0-6 months):

- identify representative for state Hazard Mitigation Committee
- discuss and select mechanism for representative to state committee to keep communities in region informed about ongoing hazard mitigation activities.
- review and revise model hazard mitigation plan and draft guidance, focusing on regional issues.
- list assistance that could be provided by state committee to local communities as they develop their hazard mitigation strategies.

Appendix 5

Regional Meeting on Hazard Mitigation South County Coastal Communities October 18, 1995 Meeting Notes

Attendance

- **16** people attended from 5 towns in South County, 4 state agencies (RIEMA, DEM, CRMC, Building Commission), 1 FEMA representative and the URI/CRC (see attendance sheet)

The goals of the meeting:

1. Inform the communities of the changes in National disaster assistance programs.
2. Get a preliminary assessment of the vulnerability of South County to natural disasters (storm, flood, fire, earthquake).
3. Make recommendations on how the region should move forward to develop a strategy for reducing such risks through mitigation.
4. Decide how to dovetail and influence ongoing state efforts in hazard mitigation.

Summary:

1. Informing communities of current state/federal initiatives:
 - RIEMA has a good track record of utilizing mitigation funds and is interested in having all communities develop mitigation plan so that Federal monies can be obtained to implement a mitigation plan and specific projects identified.
 - Break the damage/repair cycle and develop hazard mitigation initiatives • sustained action to reduce risk to property, human life, natural resources and economic health.
 - Increased exposure to risk through increased development and increased value of properties has catalyzed FEMA and RIEMA to emphasize pre-disaster mitigation planning.
 - National mitigation strategy: the goal by 2010 includes changing public perception of hazards and reducing damages and losses by at least 50%.
 - FEMA is developing partnerships with states and working in close cooperation to develop performance partnership agreements (PPA). RIEMA has already initiated efforts within their PPA.
 - NFIP reform act will tighten loopholes, and will encourage mitigation through assistance grants and mitigation insurance.
2. Assessing risk and vulnerability: developing mitigation measures to reduce losses. See Table 1
3. Develop a strategy,
 - Develop an *action* strategy that is practical, Vs a plan that “sits on the shelf.”
 - Insure that each municipality has 1) a list of projects that can be undertaken to mitigate and 2) a strategy for incorporating mitigation in to ongoing local initiatives (i.e. building practices, local comprehensive plan).
 - Divide our efforts in to 1) steps we can take now and 2) initiatives to take after storm occurs.
 - Gather lessons learned from other states and disaster events here and elsewhere.
 - Develop a questionnaire so that the local officials can identify specific projects that should be undertaken (i.e. What would you change if a storm hit? What specific infrastructure is vulnerable?).
 - Guidance document is needed by towns.
 - Evaluate the potential for developing a regional “plan” to address common issues, while project specific local initiatives will be listed by each municipality. (Need guidance from FEMA)
 - Develop a menu of options for mitigation (compiled from other states. and lessons learned) so that towns can incorporate in to local efforts.
4. Dovetail with and influence state efforts
 - It is intended that the local/regional efforts will feed into RI guidance.
 - Identify partners and go ask for input for pre and post disaster coordination.
 - Coordinate with Regional Planning initiative that is being initiated with URI Community Planning Department and Washington Trust (Mike Rowe/Howard Foster).

- Develop guidance with Division of Planning to incorporate in to Local Comprehensive Planning Guidance.
- Participants were invited to November 7 meeting, as were all RI Town managers, and mayors (and Town Council president where there was no manager or mayor).
- Coordinate permitting and training (i.e. between CRMC and Building Commission/Officials for 50% criteria for substantial improvement.
- Work with utilities commission to improve post disaster utilities restoration and pre disaster mitigation techniques (i.e. burying lines).
- Develop prototype beach facilities that would exhibit appropriate building techniques and minimize “reinventing the wheel”.
- Develop cooperative agreements on pre-storm efforts, i.e. open space acquisition, and post storm needs, i.e. debris removal.
- see mitigation techniques on table 1.

Direction to go from here:

- Prepare a presentation and target groups to engage them and get input on mitigation needs and opportunities i.e. League of Cities and Towns, police chiefs, planners.
- CRC should develop a preliminary outline of mitigation strategy for the group to react to, including a “survey” to determine what hazard mitigation activities are appropriate for their towns.
- Go from town to town and meet concurrently with planner, building official, and **EMA** director to determine list of mitigation projects and site specific strategies for addressing hazard mitigation.
- Need basic understanding at local level, through public education, to convince town council, planners and public that this is worthwhile.
- Regroup in a few months to go over draft strategy and determine direction for **South County** towns.

Outstanding issues

- What will FEMA require for NFIP mitigation planning grants?
- When will FEMA guidance be available?
- Need guidance from FEMA regarding an “action strategy” Vs a “plan” and the requirements for NFIP mitigation planning monies.
- What monies are available to towns to help develop plans’?
- How do we incorporate multi-hazard mitigation into the plan, when there is little perceived threat?
- Elements of FEMA strategy include assessment, risk, and research. Can National Sea Grant Program be a partner here?

Participants

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Joseph Almeida, Jr.	RIEMA
Pam Rubinoff	CRC/Sea Grant

Risks	Mitigation
<p>public beach facilities no monies for upgrade (Charlestown) most facilities are not to standards: special allowances are made by CRMC for public facilities erosion threatens public facilities</p>	<p>raise or relocate facilities proactive activities - design, permit, get advice on new location change public expectation regarding proximity of facilities/parking to water • tighten loopholes that allow variances for public structures in vulnerable areas • maintain dunes and beach - nourishment, profiling • develop prototype facilities - coordinate with FEMA TA program and state building commissioner (beach facilities, marina standards, cabanas) • map erosion data for state in tabular form so that we can use information for setbacks</p>
<ul style="list-style-type: none"> • cleanup, debris removal, tree removal, clear roads of trees • electric - restoration coordination • lack of coordination 	<ul style="list-style-type: none"> • National Guard should assist in post disaster cleanup • need for heavy equipment for cleanup • need to designate locations for debris removal (i.e. MOU with DEM for Scarborough Beach) • assess needs for auxiliary power in shelters, police stations, hospitals • encourage placement of utility lines underground (Narr subdivision regs mandatory, while other towns are not mandatory) • tree cutting in coordination with tree warden and utility commission • proactively upgrade utility lines and system so that they are not as vulnerable to failure
<ul style="list-style-type: none"> • infrastructure maintenance • i.e. seawall in Narragansett • breakwater in Wickford 	<ul style="list-style-type: none"> • inspect infrastructure • construct toe in front of seawall • raise or repair breakwater
<p>• lack of boat ramps for evacuating boats from town waters</p>	<ul style="list-style-type: none"> • build ramps • provide signage • locate upland storage sites
<ul style="list-style-type: none"> • evacuation 	<ul style="list-style-type: none"> • provide road signage (SC and NC examples) • work with Realtors • public education • coordinate with state police and DPW (i.e. regarding bridge closures)
<ul style="list-style-type: none"> • flooding of sewage treatment plants 	<ul style="list-style-type: none"> • physical alterations • flood proofing • include this on local list for post hazard priorities • generator
<ul style="list-style-type: none"> • rebuilding to new standards • redevelopment • determination of 50% improvements 	<ul style="list-style-type: none"> • building Inspector/Commission and CRMC should coordinate with training and permitting regarding the 50% substantial improvements • education , continuing education credits • develop post storm assessment interagency committees • land acquisition - prioritize for open space • relocation • coordination of ISDS upgrade

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Appendix 7
Coastal Resources Center / RI Emergency Management Agency
1995
State of Rhode Island
Natural Hazard Mitigation Survey

Please answer the following questions to the best of your knowledge. Feel free to coordinate your response with other town staff. Written comments/clarification on the questions and answers is also encouraged although space is not always provided. This survey has **been** used in other states and is being tested in South County for its applicability to RI communities. Your input on the survey will help us make improvements. Please feel free to write comments in the margins of the survey and call CRC if you have any questions.

Survey For Planners

1. How would you rank the priority given by your municipality's governing body to the threat of severe coastal storms in comparison with other local issues? (circle one)

- 1) Very High Priority
- 2) High Priority
- 3) Medium Priority
- 4) Low Priority
- 5) Very Low Priority

2. Approximately what percentage of your municipality's land area lies in the 100-year floodplain (V-zones and A-zones subject to flooding under the National Flood Insurance Program)? (circle one)

- 1) Less than 5%
- 2) 5- 19%
- 3) 20-49%
- 4) 50-79%
- 5) 80- 100%

3. Approximately, how much of the 100-year floodplain (V-zones and A-zones subject to flooding) in your municipality is now **developed** (land which has been converted from its natural state)? (circle one)

- 1) Less than 5%
- 2) 5- 19%
- 3) 20-49%
- 4) 50-79%
- 5) 80- 100%

4. What is the **most common type of land use** now in your municipality's 100 year floodplain (V-zones and A-zones subject to flooding)? (circle one)

- 1) Single Family Detached
- 2) Multi-Family
- 3) Commercial (Including Private Recreational, Hotel/Motel)
- 4) Industrial
- 5) Public Recreational/Park Land
- 6) Other (Specify)

5. What are the types of **new development** that have occurred in the 100-year in the **last five years?** (circle all that apply)

- 1) Single Family Detached
- 2) Multi-Family
- 3) Commercial (Including Private Recreational, Hotel/Motel)
- 4) Industrial
- 5) Public Recreational/Park Land
- 6) Other (Specify)

6. Approximately what percentage of the *total dollar value* of new development occurring in your municipality in the *last five years* has located in the **100-year** coastal? (circle one)

- 1) Less than 5%
- 2) **5-19%**
- 3) **20-49%**
- 4) **50-79%**
- 5) **80-100%**

7. How abundant are undeveloped residential sites *outside* of the **100-year** floodplain (V-zones and A-zones subject to coastal flooding)? (circle one)

- 1) Very Scarce
- 2) Scarce
- 3) Moderately Scarce
- 4) Abundant
- 5) Very Abundant

8. Does your municipality have an *explicit* storm hazard reduction strategy in addition to participation in the National Flood Insurance Program? (circle one)

- 1) **No**
- 2) Yes

9. Which of the following *objectives are* included in your municipality's policies? (circle all that apply)

- 1) Guiding new *private* development into areas less susceptible to storm hazards
- 2) Locating new *public* facilities and structures in areas less susceptible to storm hazards
- 3) Relocation of existing *private* development into less hazardous areas
- 4) Relocation of existing *public* facilities and structures into less hazardous areas
- 5) Increasing evacuation capacity
- 6) Provision of adequate storm shelters
- 7) Increasing ability of *private* structures and facilities in **hazardous** areas to withstand storm forces
- 8) Increasing ability of *public* structures and facilities in hazardous areas to withstand storm forces
- 9) Structurally altering and/or reinforcing the coastal environment (e.g., seawalls, bulkheads)
- 10) Conserving protective features of the natural environment (e.g., dune protection)
- 11) Other (specify)_____

10. Following are programs and projects which *structurally alter the coastal environment*. If in use in your community, indicate to **what** extent they reduce local vulnerability to storm hazards (from 1=Don't reduce hazards at all to 5=Reduce hazards very much).

- | | | | | | |
|---|----------|---|---|---|---|
| 1) Sand-trapping structures (e.g., groins, jetties) | 1 | 2 | 3 | 4 | 5 |
| 2) Sand-moving programs (e.g., beach nourishment, beach scraping) | 1 | 2 | 3 | 4 | 5 |
| 3) Shoreline protection works (e.g., bulkheads, seawalls, revetments) | 1 | 2 | 3 | 4 | 5 |
| 4) Flood control works (e.g., dikes, channels, retaining ponds) | 1 | 2 | 3 | 4 | 5 |
| 5) Other (specify)_____ | 1 | 2 | 3 | 4 | 5 |

11. Following are programs and policies which *strengthen buildings and facilities* to better withstand storm forces. If is used in your community, indicate to what extent they reduce local vulnerability to storm hazards (from 1=Don't reduce hazards at all to 5=Reduce hazards very much).

- 1) Building code

1	2	3	4	5
---	---	---	---	---
- 2) Special storm-resistant building standards (e.g., wind-resistant standards)

1	2	3	4	5
----------	---	---	---	---
- 3) Minimum elevation and flood proofing standards required under National Flood Insurance Program

1	2	3	4	5
---	---	---	---	---
- 4) **Elevation/floodproofing** standards more extensive than required by National Flood Insurance program.

1	2	3	4	5
---	---	---	---	---
- 5) Floodproofing of public facilities and structures (e.g., sewer and water, roads, utilities)

1	2	3	4	5
---	---	---	---	---
- 6) Other (specify)_____

12. Following is a list of plans, programs, and policies which *guide and manage development*. Indicate which are *currently in use in your municipality* and, if they are used, to what extent they reduce local vulnerability to storm hazards (from 1=**Don't** reduce hazards at all to 5=**Reduce** hazards very much).

Planning

- 1) Comprehensive or land use plan 1 2 3 4 5
- 2) Hurricane/storm component of comprehensive or land use plan 1 2 3 4 5
- 3) Capital improvements program 1 2 3 4 5
- 4) Recovery/reconstruction plan or policies 1 2 3 4 5
- 5) Evacuation plan 1 2 3 4 5

Development Regulation

- 6) Zoning ordinance 1 2 3 4 5
- 7) Subdivision ordinance 1 2 3 4 5
- 8) Dune protection 1 2 3 4 5
- 9) Shoreline setback 1 2 3 4 5
- 10) Special hazard area ordinance 1 2 3 4 5

Public Facilities Policy

- 11) Location of capital facilities to reduce or discourage development in high hazard areas 1 2 3 4 5
- 12) Location of public structures and buildings (e.g., hospitals, schools) to reduce extent of risk to public investments 1 2 3 4 5

Taxation, Financial, Other Incentives

- 13) Reduced or below-market taxation for open space and non-intensive uses of hazard areas 1 2 3 4 5
- 14) Impact tax or special assessment to cover the additional public costs of building in hazard zone 1 2 3 4 5
- 15) Transfer of development potential from hazardous to non-hazardous sites (e.g., clustering, planned unit development) 1 2 3 4 5

Public Acquisition

- 16) Acquisition of undeveloped land in hazardous areas (e.g., for open space) 1 2 3 4 5
- 17) Acquisition of development rights or scenic easements 1 2 3 4 5
- 18) Acquisition of damaged buildings in hazardous areas 1 2 3 4 5
- 19) Building relocation program (moving structures) 1 2 3 4 5

Information Dissemination

- 20) Hazard disclosure requirements in real estate transactions 1 2 3 4 5
- 21) Construction practice seminars for builders 1 2 3 4 5
- 22) Other (specify) _____ 1 2 3 4 5

13. Please *rank* the following three approaches according to their potential overall effectiveness in reducing storm hazards in your municipality (i.e., 1=most important; 3=least important).

- 1) Structural Reinforcement of Coastal Environment
- 2) Strengthening Buildings and Facilities
- 3) Development Management

14. How would you rate the **combined** effectiveness of the programs and policies identified in the previous questions 10, 11, and 12 at reducing storm hazards in your municipality? (circle one)

- 1) Very Effective
- 2) Moderately Effective
- 3) Slightly Effective
- 4) Not Effective

15. Have you had any **problems in** enforcing or **implementing** the development management programs and policies listed in question 12? (circle one)

- 1) No (see question 16b)
- 2) Yes (see question 16a)

16a. If Yes, which of the following have been problems? (circle all that apply)

- 1) Insufficient Funds
- 2) Lack of Qualified Personnel
- 3) Insufficient Data Base
- 4) Public Opposition
- 5) Lack of Support by Public Officials
- 6) Other (specify)

16b. If No, what do you attribute your success to? (circle all that apply)

- 1) Sufficiently Funding/Incentives for Homeowners
- 2) Adequate Personnel for Enforcement
- 3) Public Support of Guidance/Regulation
- 4) Support and Assistance from State and Federal Agencies
- 5) Other (specify)

17. Have any **undesirable consequences** resulted from the development management programs and policies listed in question 12? (circle one)

- 1) No
- 2) Yes

18. Which of the following have been experienced as a result of managing development programs and policies in question 12? (circle all that apply)

- 1) Increase in Construction Costs
- 2) Reduced Land Values
- 3) Reduced Tax Revenues
- 4) Slowed Economic Growth and Development
- 5) Other Consequences (specify)_____

19. We are interested in learning more about the **obstacles to the enactment** of development management measures which reduce storm hazards in your municipality. Which of the following would you anticipate in your community? (Circle appropriate numbers: 1=not an obstacle to 5=large obstacle.)

- 1) Opposition of business interests
| 2 3 4 5
- 2) Opposition of real estate and development interests
| 2 3 4 5
- 3) Opposition of homeowners
| 2 3 4 5
- 4) Absence of politically active individuals and groups advocating hurricane/storm mitigation
| 2 3 4 5
- 5) More pressing local problems and concerns
| 2 3 4 5
- 6) General feeling that community can "weather the storm"
| 2 3 4 5
- 7) General conservative attitude toward government control of private property rights
| 2 3 4 5

8) Lack of adequate financial resources to implement mitigation programs

1 2 3 4 5

9) Lack of trained personnel to develop mitigation programs

1 2 3 4 5

10) Lack of incentives or requirements from higher levels of government

1 2 3 4 5

11) Inadequate or inaccurate federal flood insurance maps

1 2 3 4 5

12) Other (specify) _____

1 2 3 4 5

20. Following are some *arguments often* cited in opposition to the enactment of development management measures to reduce storm hazards. How important have these been in your municipality? (Circle appropriate numbers: 1=not important to 5=very important.)

1) Development management measures dampen local economy

1 2 3 4 5

2) Development management measures lead to increased development costs

1 2 3 4 5

3) Decisions about risks from coastal storms are best left to the individual

1 2 3 4 5

4) Particular development management measures are illegal or unconstitutional

1 2 3 4 5

5) Other (specify) _____

1 2 3 4 5

21. Has your municipality been hit by one or more severe coastal storm *since* 1990 (i.e., **hurricanes**, tropical storms, and nor'easters which have caused substantial property damage)?

1) No

2) Yes

22. If Yes, please indicate below the name and date of the *most recent* and *most damaging* hurricane/storm during this period. (If most recent is also most severe, write the word "same".)

23. Were stronger or more stringent measures to manage development adopted following either or both of these storms? 1) No

2) Yes

24. How familiar are you with sources of state government assistance to localities for storm hazard management? (circle one)

1) Very Familiar

2) Somewhat Familiar

3) Neither Familiar nor Unfamiliar

4) Somewhat Unfamiliar

5) Very Unfamiliar

25. Has your local government received any of the following types of storm hazard management assistance from state government in the past five years? (circle all that apply)

1) Floodplain Maps

2) Hydrologic Data

3) Information on the National Flood Insurance Program

4) Help with Storm Drainage Problems

5) Help with Disaster Preparedness Plans

6) Help in Administering Hazard Area Regulations

7) Grants or Loans for Construction of Storm Protection Works

8) Grants or Loans for Acquisition of Hazard Area Property

26. During the past year, has your local government had any of the following types of contact with state government personnel concerning storm hazard management? (circle all that apply)
- 1) Personal Visits (Face-to-Face Contact)
 - 2) Telephone Contacts
 - 3) Correspondence Related to Storm Hazard Management
 - 4) Received Technical Reports on Hurricane Hazard Mitigation
 - 5) Other (Specify)
 - 6) None of the Above; No Contact during Past Year

27. Please indicate the approximate peak and **permanent** populations for your municipality in 1994.

28. Do you know approximately how long it would take to **safely evacuate** your municipality, assuming peak population, should a hurricane threaten? (circle one)
- 1) No
 - 2) Yes If Yes, how long: _____ hours

29. What is the approximate number of full-time staff in your planning department?

30. What was the total value of all building permits issued in your municipality in 1994?

31. How many square miles are there in your municipality? _____

32. Rate the following according to their importance to your municipality economic base. (Circle appropriate numbers: 1=not important to 5=very important.)

- | | | | | | |
|---------------------------|--|---|---|---|---|
| 1) Tourism and Recreation | | 2 | 3 | 4 | 5 |
| 2) Manufacturing | | 2 | 3 | 4 | 5 |
| 3) Service and Trade | | 2 | 3 | 4 | 5 |
| 4) Retirement | | 2 | 3 | 4 | 5 |
| 5) Fishing | | 2 | 3 | 4 | 5 |
| 6) Agriculture | | 2 | 3 | 4 | 5 |
| 7) Other (specify) _____ | | 2 | 3 | 4 | 5 |

Your Name _____

Position _____

Town _____

Thank You for Your Assistance!

- Y ___ N ___ were the survey questions applicable to your municipality?
 Y ___ N ___ was the survey relatively straightforward and easy to complete?
 Y ___ N ___ were the questions and answers clear to the reader?
 Y ___ N ___ was the survey too long to complete?
 _____time to complete survey

Comments _____

Special thanks to Professor David Godschalk (Univ.of North Carolina), and to Jay Northrup from the Connecticut Dept. of Environmental Protection for granting permission to use questions from their respective surveys. Good works such as these allows us the opportunity to more rapidly advance Hazard Mitigation in Rhode Island.

***** end of survey *****

Proposal
Developing an interactive computer program that would assist in identifying risks, mitigation strategies, and priorities for implementation

Information associated with risk assessment and mitigation planning is typically site specific and contains a large number of variables. In most mitigation planning initiatives, data is collected through a time consuming and costly process of research, workshops and meetings. This detailed process does not provide the flexibility of planning for large areas, linking many small local efforts together, or connecting the data with regional or state government contacts. To remove these barriers to mitigation planning at a regional/state level and provide a mechanism for integrating the large amounts of spatial data, a software package needs to be developed that can:

- query the users knowledgeable about the area;
- collect and store data about risk, vulnerability, and mitigation strategies for a geographic area (i.e. local community);
- manipulate that data to examine relations between data sets (i.e. between local and state properties);
- display the data in tabular and graphical form useful for implementation;
- link data sets from different geographic areas; and
- use GIS capabilities to link information and geographic locations for analysis, mapping and implementation.

CRC/Sea Grant propose to develop a software package that can be used to help define the risk from natural hazards and identify strategies to mitigate the affects of those hazards on an area (municipality, county, state, etc.). A primary focus will be to design the software so that it can be used easily by local officials as they develop and implement local hazard mitigation plans. The software will allow local data sets to be linked to other local data sets and combined to form a statewide risk assessment and mitigation plan.

The software will define risk by querying the user about high risk areas, objects at risk and repetitive loss areas. Querying will be done through pre-established questions and by asking the user to locate risk areas and structures/sites on a map. This information will be stored in a relational database which can display outputs graphically (e.g., maps, figures, graphs) and in tabular formats. This is essential for setting statewide priorities and developing local/regional planning initiatives. The software will include an index of mitigation strategies that the user can apply to identified risks.

Suggested risk assessment questions and mitigation actions that could be contained in an index are attached in the hazard mitigation matrix. This matrix shows the types of questions and information that could be collected and manipulated by the software package. Without an automated software package, this information must be collected by Emergency Managers through expensive and long workshops and meetings. Additionally, management of this information is critical and is essential in developing a hazard mitigation plan. With the software, a single disk can be mailed to the appropriate town officials who simply answer the questions posed by the software. Once the disk is returned to the Emergency Manager, the software will automatically combine the data and prepare a preliminary report identifying risks and appropriate mitigation strategies.

Our proposed approach is to:

- develop a desired matrix of risk/mitigation information to be collected by the software
- obtain digital maps with town boundaries, roads and major facilities, buildings (if available), repetitive losses (if available from insurers, NFIP, etc.)
- design a query based program on PC that links matrix and maps. The software will include questions regarding types of risks, suggest appropriate mitigation activities which could be chosen by the user. Information will be sorted by risk type, location, and priority.
- work with the local information to create a mitigation data base and produce a plan for each town in RI with data obtained from program.
- work with state officials and analyze local data to determine a statewide mitigation strategy which outlines where critical mitigation activities need to be implemented (i.e. through 404 funds, NFIP flood mitigation assistance grants, etc.).

Once developed and tested, this software can be used by FEMA throughout the country to conduct community-based risk assessments and develop mitigation strategies.
