

Hawaii State Multi-Hazard Mitigation Plan Executive Summary

Hawaii State Hazard Mitigation

The State of Hawaii is committed to a long-term strategy for reducing the risks of natural hazards. Hawaii State has experienced a range of climate and hydrological hazards, seismic and geological hazards, and technological hazards that have resulted in great costs to lives, property, and the economy of the state. On September 11, 1992, Hurricane Iniki swept across the island of Kauai, and a decade later the County had not fully recovered from the impact of the storm on the economy and tourism industry. The total cost of the disaster exceeded \$1.8 billion, not including the impact on employment and the quality of life for Kauai citizens. In November 2000, flooding in Hilo, Hawaii caused damage more than \$50 million. These disasters were severe, but estimates during post-disaster assessments demonstrate that a Hurricane Iniki-strength storm (Category 3) on O'ahu would result more than \$23 billion dollars in damage to the City & County of Honolulu, and would have resulted in loss of services to the neighbor islands, nearly collapsing the economy of Hawaii State.

Costs of Disasters in Hawaiian Islands
1959 – present

Date	Disaster	Amount of Damage
11/2000	Hilo Flooding	~\$50 million
9/10-11/92	Hurricane Iniki	\$ 1.6 billion
11/23/83	Hurricane Iwa	\$239 million
1/8-10/80	Kona Storm	\$ 12.9 million
5/23/60	tsunami	\$ 23 million
8/4-6/59	Hurricane Dot	\$ 6 million
4/1946	tsunami	\$ 26 million

And Loss of Life....

*dollars given in the year damage occurred

In response to these studies, the state focused on developing a framework and process for hazard mitigation in the state. Hazard mitigation refers to *actions and measures taken before an emergency occurs and includes any activity to reduce the impacts from a disaster*. The purpose of the hazard mitigation plan is to protect lives and property from loss and destruction during a natural hazard. Hazard mitigation helps to maintain the

quality of life by reducing the immediate costs of response and recovery to hazards and long-term costs to the economy.

The Disaster Mitigation Act of 2000 and Hazard Mitigation Planning

44 CFR Part 201, Hazard Mitigation Planning, establishes criteria for state and local hazard mitigation planning authorized by §322 of the Robert T. Stafford Act as amended by §104 of the Disaster Mitigation Act of 2000. States and counties must have approved hazard mitigation plans by November 1, 2004 to receive Pre-Disaster Mitigation funding. The Standard State Hazard Mitigation Plan will also be required for non-emergency assistance provided under the Stafford Act, including Public Assistance restoration of damaged facilities and the Hazard Mitigation Grant Program. The development of state and local hazard mitigation plans is critical for maintaining eligibility for future Federal Emergency Management Agency (FEMA) mitigation and disaster recovery funding.

The Mitigation Planning Process

The hazard mitigation planning process began with increased public awareness and education. The Hawaii State Hazard Mitigation Forum became established after two years of discussions and development in 1998. The Forum members met first to develop bylaws and strategize ways to incorporate hazard mitigation in policy and daily operations in Hawaii. Even though the State had implemented a number of hazard mitigation projects with funding from the Hazard Mitigation Grant Program, knowledge of hazard mitigation opportunities had not extended into the consciousness of agencies and organizations in the way they conducted business. The Forum decided that it needed to begin with a public education and awareness campaign that reached the population through information in public venues, libraries, and on the internet.

The Disaster Mitigation Act of 2000 required local plans to be developed first. Because the state recognizes the importance of the roles that the county governments play in enacting programs at the local level, the Forum supported the development of county plans as the foundation for the state's hazard mitigation plan. All of the counties received funding from Project Impact, which assisted them in developing their hazard mitigation plans. In each county, the executive branch and the civil defense agency convened a steering and technical advisory committee, and invited partners to participate in planning and mitigation activities. Through a series of committee meetings, the planning teams conducted briefings on hazard mitigation and on the development of a risk and vulnerability assessment and a hazard mitigation plan. As the information flow increased among the committees and planning teams, the process improved and the assessment and strategy became better informed.

The counties invited the general public to participate in the hazard mitigation planning processes. The Mayors held several discussions on public television shows, the Civil Defense Administrators presented discussions about hazard mitigation and the goals of hazard mitigation planning programs to community groups and local organizations, the Contractor's Association of Kauai published a newsletter that featured a series of

articles about natural hazards and mitigation measures, and other media forums directed attention to the website, www.mothernature-hawaii.com, where county-specific mitigation actions were featured. The Building Industry Association of Hawaii also featured information booths and distributed materials for mitigating hazards. In Chapter 2, mitigation partners are listed and discussed in further detail.

As awareness increased throughout the counties, it became easier to develop the hazard mitigation plans. The state planning process benefited from the county planning processes. The State has the responsibility to ensure the viability and recovery of the state in any disaster. The best strategy has been to build the state planning process through partnerships, networks, and the local mitigation enhancements.

Risk and Vulnerability Assessment

The State of Hawaii assessed hazard risks and vulnerability based on information compiled in a geographic information system. Hazard layers were developed using a variety of data sources, but were most important in assessing county risks and vulnerabilities. State critical facilities and lifeline infrastructure were included in the county risk and vulnerability assessments, and the county assessments form the basis of the state's risk and vulnerability assessment. More work will be needed in the future to take full advantage of GIS for mitigation planning. The state's GIS conveyed adequate information for the first risk and vulnerability assessment. The best hazard layers include the Flood Insurance Rate Maps (FIRMs), many of which need to be updated, and the tsunami inundation layer. The *Atlas of Natural Hazards in the Hawaiian Coastal Zone* (Fletcher et. al. 2000) provided a tremendous resource in identifying hazard risks throughout the state.

The assessments have shown risks on all islands for hurricanes and high winds, landslides, erosion, flooding, wildland fires, drought, tsunami, storm surge, earthquakes, and volcanoes. Some of these hazard events have not been as immediately devastating as hurricanes and tsunamis, but many hazard events can cost the county thousands of dollars for each clean-up and opportunity costs in productivity and funding. Flooding events have cost individuals and small businesses excessive amounts in personal funds to remove water and mud, replace damaged flooring and furniture, and remove debris. The risk and vulnerability assessment process allowed these people to include their concerns and ideas for reducing these hazards. The community and public agencies verified information provided in the maps and identified assets that are critical to the protection of life and property. The risk and vulnerability assessment processes allowed communities to include their concerns and ideas for reducing these hazards.

The risk and vulnerability assessment processes helped to inform the state and counties about the condition of existing hazard and asset data. The process helped to build information management capacity in the counties for disaster management and for day-to-day operations. The concerted effort in developing data for mitigation planning has improved data management plans as well. The state has identified the need to

network among public agencies at federal, state, and county levels to enhance its geographic information system resources and data management.

Even as this plan is being finalized, new studies conducted locally by Martin & Chock, Inc. have demonstrated the need to include topographical information in wind risk modeling to improve building codes and standards. Other studies have improved knowledge of changing shorelines and erosion rates, as well as methods for beach replenishment. New technologies in LIDAR and remote sensing imagery offer the ability to improve building inventories and footprints to improve modeling. Models on lava flow scenarios will benefit county planners and government officials. There are many ongoing studies that will be incorporated into models and mapping assessments over the next few years that will continue to improve information for decision-making and planning.

Mitigation Priorities

The State of Hawaii has been committed to hazard mitigation for decades. The review of implemented mitigation measures and actions in chapter five demonstrates this dedication. The state recognizes that hazard mitigation depends on appropriate land use policies and practices, including zoning and coastal zone management, flood control, building codes and standards, infrastructure development and standards, regulatory measures, incentive programs, and participatory planning methods. In order to set priorities, the state developed goals and objectives (see Table 1). These goals and objectives ground the mitigation actions and policies that will be developed in this plan.

Table 1. Hazard Mitigation Goals and Objectives.

Goal 1:	Protect life and ensure safety of people in Hawaii <u>Objective 1:</u> Ensure adequate sheltering space for residents <u>Objective 2:</u> Ensure adequate sheltering space for visitors <u>Objective 3:</u> Improve lifelines, infrastructure, ports of entry and critical facilities, and reduce their vulnerability to hazards <u>Objective 4:</u> Work with the Counties to assist in improvements of building codes and building inventories and assessments. <u>Objective 5:</u> Ensure knowledge and accessibility of response plans, security threat levels, and evacuation routes. <u>Objective 6:</u> Ensure emergency services and medical facilities can care for victims of disasters.
Goal 2:	Develop and implement the Statewide Hazard Mitigation Plan based on a comprehensive, multi-hazard risk and vulnerability assessment <u>Objective 1:</u> Develop a statewide risk and vulnerability assessment <u>Objective 2:</u> Maintain and update RVA based on new and improved data and technology <u>Objective 3:</u> Develop appropriate protocols for data sharing and management at federal, state, and local levels <u>Objective 4:</u> Use HAZUS and RVA models and scenarios to identify risks and develop improvements <u>Objective 5:</u> Continue to monitor, evaluate, and update the assessments and plan, and proactively use the plan.
Goal 3:	Ensure the protection of the State's natural, built, historical, and cultural assets <u>Objective 1:</u> Identify and map assets, including sensitive environmental features and natural habitats, buildings and urban developments, historical buildings and properties, and cultural sites and use areas. <u>Objective 2:</u> Maintain and update databases on new and improved data and technology with attention to securing data that should not be shared publicly (i.e. sacred sites for heiau and burial) <u>Objective 3:</u> Incorporate indigenous knowledge into hazard mitigation planning

Objective 4: Ensure adequacy of building codes and standards

Objective 5: Ensure adequacy of land use regulations and zoning standards

Objective 6: Minimize environmental degradation and ensure habitat recovery

Goal 4: Ensure the long-term viability of the State’s economy and the livelihood of the local population

Objective 1: Assess economic risk and vulnerability for multiple hazards

Objective 2: Develop strategies to ensure that financial institutions and other critical businesses can operate during crises

Objective 3: Develop small business strategies and contingency plans to help businesses reopen quickly following crises

Objective 4: Develop reconstruction and rehabilitation plans to ensure rapid recovery from disasters

Objective 5: Make plans with the Hawaii Visitors Association to ensure the operability of the visitor industry to prevent long-term repercussions to the tourism industry, which is critical to Hawaii’s economy

Goal 5: Ensure public awareness of risks, vulnerability, and multi-hazard mitigation actions through public education

Objective 1: Improve the State Hazard Mitigation Forum’s website www.mothernature-hawaii.com with updated risk and vulnerability assessments and plans.

Objective 2: Continue the public awareness campaign to direct attention to the website for information distribution

Objective 3: Run drills and training exercises to make sure that organizations, community-based groups, and emergency services know how to respond during crises.

Objective 4: Ensure that non-structural mitigation measures are incorporated into mitigation public awareness programs.

The county mitigation plans provide the basis for setting priorities at the local level and the state recognizes these. The Hawaii State Hazard Mitigation Forum helped to establish goals, objectives, and priorities for mitigation plans and actions. The Forum has prioritized critical facilities and infrastructure for this first strategy, focusing on those things that are most important to the protection of life and property, and the well-being of the people in the State of Hawaii. The mitigation actions and measures have been included in tables in Chapter 6.

Mitigation Plan Implementation and Maintenance

The State of Hawaii developed a structure for disaster risk management that will ensure implementation of the hazard mitigation plan. The Hawaii State Hazard Mitigation Forum will provide guidance to the state and counties in further developing strategies and in updating the risk and vulnerability assessment and hazard mitigation plans. The Forum meets quarterly, at a minimum, to review progress on implementation of the Hazard Mitigation Plan and mitigation actions.

The State recognizes that the current effort is based on the best available data and information. However, as projects and programs are completed and as new policies are implemented, it will be important to update the document and reprioritize the strategy. The Hawaii State Hazard Mitigation Forum and State Civil Defense will help to develop appropriate protocols for information sharing and data improvement contained in the geographic information system.

Support by the Governor and government leaders in Hawaii ensures that hazard mitigation will remain a priority in the future. The increased awareness and participation by the general public will make it easier to implement projects and provide input into future needs in minimizing risks and vulnerability to hazards.