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**CHAPTER 7:**

**Kaua'i County Hazard Mitigation Strategy**

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***Mayor Carvalho's Vision:***

**TO KEEP THE RURAL CHARACTER OF OUR ISLAND BY PRESERVING OPEN SPACE AND ACCESS TO OUR NATURAL RESOURCES AND FOSTERING BALANCE BETWEEN OUR CULTURAL PAST AND THE FUTURE...**

## **7.0 Introduction to the Mitigation Strategy**

This chapter outlines the mitigation strategy according to the latest FEMA requirements, specified in the local mitigation plan guidance and crosswalk. In this section, there are the following sub-sections as specified in the topic sub-headings for this section of the plan: 1) Local Hazard Mitigation Goals (§201.6(c)(3)(i)); 2) Identification and Analysis of Mitigation Actions (§201.6(c)(3)(ii)); 3) Identification and Analysis of Mitigation Actions: NFIP Compliance (§201.6(c)(3)(ii)); and, 4) Implementation of Mitigation Actions (§201.6(c)(3)(iii)).

## **7.1 Local Hazard Mitigation Goals**

The Mayor's stated vision for the county speaks to the attention to principles of long-term sustainability of Kaua'i County, its environment, and its people. The focus on sustainability means that Kaua'i County must focus on multi-hazard mitigation in the context of disaster risk management. Given limited resources in Kaua'i County for disaster management, limited personnel, and often overlapping responsibilities and use of resources, Kaua'i County has developed goals and objectives that support preparedness as well as hazard mitigation in order to take advantage of opportunities to support disaster management. The more that communities and the County are sustainable, the more resilient they will be to impacts from disasters.

Kaua'i County continues to emphasize the protection of critical facilities and infrastructure – those things critical to the protection of life, property, and the livelihood of the county's residents. These priorities align with the vision of the Mayor in protecting cultural heritage and natural resources. In addition to the emphasis on critical facilities, Kaua'i County recognizes the importance of local knowledge and community involvement in the implementation of risk reduction measures and building resilience in face of disaster. The goals and objectives reflect the understanding that

Kaua'i has a remarkably resourceful population that has recovered from previous disasters, and therefore, builds the strategy reflecting the value of its communities.

According to these guiding principles, Kaua'i County has developed a list of mitigation and disaster management goals and objectives. The Disaster Mitigation Committee (DMC) reviewed and revised the goals and objectives from 2003, and added objectives that reflect current needs in 2009. These goals and objectives were recommended for approval by the Mayor as part of the plan adoption. The goals and objectives are to:

**1) Implement, refine, and revise the Multi-Hazard Mitigation Plan based on updates of the risk and vulnerability assessments.**

Objective 1: Identify, monitor, and support current and ongoing mitigation policies and activities in different sectors of county government and by hazard (the focus of chapter six).

Objective 2: Use the maps (in chapter five appendix) to identify critical facilities that lie in vulnerable areas and determine potential projects that will reduce the impacts of the identified hazards on these facilities (mitigation projects of this chapter).

Objective 3: Identify and prioritize projects for potential funding from the pre-disaster mitigation grant program (projects identified in Table 7-1 in this chapter).

Objective 4: Identify multi-hazard mitigation policies and activities that can be improved as part of the current activities and functions of agencies (asset identification in chapter four and the chapter five risk and vulnerability assessment with policy recommendations by hazard in this chapter).

Objective 5: Review goals and objectives annually to monitor implementation (this section and chapter eight on maintenance and plan implementation).

**2) Engage in disaster public awareness activities that improve implementation of the plan, building on the network of the hazard mitigation community at local levels, in the County, and with the State.**

Objective 1: Use risk and vulnerability assessment and maps to improve the quality of public awareness materials distributed in the County of Kaua'i.

Objective 2: Use information from this mitigation plan ---the multi-hazard risk and vulnerability assessment and the mitigation strategy---to improve the information on the State Hazard Mitigation Forum's website ([www.mothernature-hawaii.com](http://www.mothernature-hawaii.com)) pertaining to Kaua'i County where this plan is distributed.

Objective 3: Use the website, libraries, and county agency interactions to ensure public awareness of all hazards, including the hazard mitigation plans, and to get feedback from the public on the plan to make improvements annually.

**3) Improve communications systems.**

Objective 1: Ensure remote areas remain reachable during a disaster event and that warning sirens and information systems are working.

Objective 2: Test communication lines and ensure that the new Emergency Operations Center has connections with all emergency providers.

Objective 3: Utilize the Utility Disaster Preparedness and Response Group to advise and recommend improvements in telecommunications that will reduce vulnerability of the sector and increase capability for communications throughout the county.

Objective 4: Continue to use local communications networks (formal and informal) and information-sharing that will inform the greatest number of people about risks and help them receive warning information to take action in disaster.

Objective 5: Involve community organizations in communications network to ensure that local citizens remain informed and aware of disasters and response.

**4) Ensure that adequate shelter is available to all residents and visitors.**

Objective 1: Harden and retrofit identified shelter facilities to improve ratings of facilities (see assets section in chapter four).

Objective 2: Conduct an assessment of population, location, and sheltering needs based on residences that might be shelter worthy to identify true need for shelters in different types of disasters, based on specific population needs.

Objective 3: Ensure the development of shelters for special needs populations and pet-friendly facilities.

Objective 4: Encourage residents and hotels to harden, retrofit and build safe rooms to take responsibility for sheltering (see safe room ordinance in chapter four appendix and hardening projects in section four of this chapter).

Objective 5: Continue to get formal agreements from large hotels to protect visitors by providing safe shelter space for visitors and employees (listed in section four under mitigation projects for shelters).

Objective 6: Conduct HAZUS-MH model analyses on State facilities (Department of Education schools) to determine the viability of the structures to multiple hazard risks and identify mitigation actions to secure facilities for sheltering.

**5) Secure, mitigate, and maintain lifelines, especially those that provide access for medical assistance and transport of food, materials, and fuel.**

Objective 1: Ensure compliance with the National Incident Management System (NIMS) to ensure debris clearance, transportation, and security of critical lifelines and facilities in disasters.

Objective 2: Identify roadways and ports of entry used during emergencies in disaster response plans and make agreements with debris removal operations to clear roadways during disaster situations to maintain access to pumping stations and fuel storage to operate facilities.

Objective 3: Harden hospital facilities and maintain access to the facilities and their utilities.

Objective 4: Work with local communities to find alternative transportation and evacuation routes, designate facilities to use in emergencies should communities become isolated, and enhance food/water development, storage, and security.

**6) Enhance and use Kaua'i County's geographic information system (GIS) and data to improve planning, permitting, and building such that disaster risks are reduced.**

Objective 1: Use the database and geographic information systems developed for the risk and vulnerability assessment (chapters three, four, and five appendices) to make decisions for disaster response plans and mitigation activities.

Objective 2: Continue to use the web-based ArcIMS county servers to access and share information among Kaua'i County agencies. Develop a protocol for sharing information with community organizations that could benefit from using GIS in community planning activities.

Objective 3: Continue to identify missing data and gaps in the risk and vulnerability assessment by working with county agencies and communities to “ground-truth” data, and incorporate these into the Kaua'i County GIS system.

Objective 4: Enable use of the GIS systems, including hazard risk and vulnerability assessment information, for the building and land use permit system and implementation of flood risk reduction measures.

Objective 5: Work with the State Civil Defense and Hazard Mitigation Forum in improving GIS capacity for Kauai at the State level through agreements with County GIS Coordinators and Information Technology to improve the overall quality of data and ability to share data for hazard mitigation purposes.

Objective 6: Use the GIS Master Plan to inform risk reduction efforts in the county (Chapter 6 Appendix<sup>1</sup>). The current system provides updated capability for the county.

7) **Harden essential and governmental facilities to maintain operations during a disaster and recovery operations, and improve building codes to reduce risks.**

Objective 1: Identify essential facilities and governmental facilities that must maintain operations (in chapter four “assets” and chapter five “risk and vulnerability assessment” appendix tables and maps). Inventory hardening and retrofit requirements.

Objective 2: Continue to advance proposals using strong benefit-cost analyses to harden and retrofit facilities and seek funding from FEMA and other federal, state, and county agencies and organizations.

Objective 3: Continue to work with the State and Department of Public Works Building Division to identify building code improvements and amendments based on topographic risks to ensure improved building codes and mitigation actions, including training, related to building recovery can take place following a disaster.

## **7.2 Identification and Analysis of Mitigation Actions**

The emphasis for this mitigation strategy continues to target the protection of assets in Kaua'i County that will ensure sustainable development and protection of life, property, and resources. The strategy to meet these objectives is twofold: **1) Engage in mitigation**

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<sup>1</sup> Geographic Information Systems Master Plan for the County of Kauai, Draft for Review,, December 18, 2007 prepared by the Department of Finance Information Technology Division

and risk reduction through existing programs, policies, administrative rules, agency mandates, and community and non-governmental actions; and 2) Identify actions that need to be taken to reduce risks and seek funding, staff, expertise, and resources to support these necessary activities.

### 7.2.1 Status of Previous Mitigation Actions

The ongoing or implemented mitigation actions that are part of organizational roles and responsibilities and existing policies, administrative rules, and actions were included in Chapter 6, with highlights of collaboration and best practices included in the appendix.

From the recommended actions requiring external resources in 2003, three of the mitigation projects were supported. The primary mitigation actions from the previous plan that were approved and funded include building hardening projects for the Pi'ikoi Building, the Mo'ikeha Building, and the Historic County Building (although the funding has not come through from FEMA). In addition, a structural wind risk analysis was conducted to improve decision making concerning upgrading building codes.

The following actions recommended in the 2003 plan have been implemented:

- 1) **Hardening Pi'ikoi Building** – Renovations are being implemented; facility could be hardened to provide additional shelter space. Coordinated by the Department of Public Works Building Division.
- 2) **Hardening Mo'ikeha Building** – Renovations are being implemented; facility could be hardened to provide additional shelter space. Coordinated by the Department of Public Works Building Division.
- 3) **Hardening Historic County Building** – Renovations are being implemented; facility could be hardened to provide additional shelter space. Coordinated by the Department of Public Works Building Division.
- 4) **Pet Sheltering Humane Society** – Project planned with the Red Cross to use the basement area as a shelter. Completed and accepted 2007. Coordinated by the Humane Society with assistance from the Contractors Association of Kaua'i and Red Cross, with some grant support from the National Association of Contractors.
- 5) **Developing Hotels as Shelters** - Hotels have been consulted as partners to provide shelter spaces for visitors in addition to their guests, but currently discussions have occurred in facilities that have more than 500 rooms, such as the Kaua'i Marriott, Hyatt, and Princeville Resorts. Princeville Resort opened as a shelter with assistance from the Red Cross for Hurricane Iniki. Additional discussions have been coordinated through the Po'īpu Beach Resort Association that works with hotels and resorts in the Po'īpu area. Coordinated by Kaua'i Civil Defense with assistance from the Kaua'i County Economic Development Office.
- 6) **Implementing the Safe Room Incentive Program** – The program was developed as a real property tax incentive program. The status is ongoing, and it is important to continue to build and maintain public awareness to encourage

participation in the program. Coordinated by Kaua'i Civil Defense with the Office of the Mayor.

- 7) ***Developing Alternate Routes around Major Highway Bridges:*** Wailua, Hanalei, Hanapepe, and other highway bridges require alternate routes but these are expensive and ongoing needs. Waimea Bypass has been implemented and serves to reduce traffic as well as provide access for swifter evacuation. Coordinated by the Transportation Agency with the State and Federal transportation departments.
- 8) ***Improving Harbor Safety and Security*** – With the importance of harbors and ports and designation as critical facilities and lifelines, funding has been made available to make improvements to reduce risks of failure at ports of entry. The Coast Guard conducted a critical facilities assessment at Nawiliwili Harbor. They have improved security through lighting systems, armed guards, and other general security measures. As part of the State's plan update, a structural risk and vulnerability assessment has been conducted at Nawiliwili Harbor, with results available in October 2010. Coordinated by Kaua'i Civil Defense with the Coast Guard, University of Hawai'i Social Science Research Institute, and Martin & Chock, Inc.
- 9) ***Relocating Fire Stations outside of Hazard Zones*** - The new fire station for Kapa'a has been sited and all permits gained. Construction began in 2009. Coordinated by the Kaua'i County Fire Department.
- 10) ***Improving Emergency Communications Systems to Ensure Field Operability*** - Communications for the EOC were improved with people in the field. The Interoperability issues have been addressed. The County has developed a Tactical Interoperable Communications Plan dated May 2008. It is law enforcement sensitive, and therefore, details cannot be disclosed. The Kaua'i plan is part of the State Interoperable Communication Plan (SCIP) completed April 2008. The plan identifies infrastructure and systems improvements. Coordinated by Kaua'i Civil Defense with the Kaua'i County Utility Preparedness and Response Group.
- 11) ***Improving Lifeline Systems Infrastructure*** – The individual utilities for electricity and telecommunications have secured funding to lay wiring underground. Communications can be improved by “going telephony” (telephones are connected through internet fiber optic connections). By using fiber optics, it is possible for a through connection to the EOC for the Lihu'e Fire Station and the Civic Center. By using underground fibers to connect county facilities, they withstand risks better. Even though there are still wiring and poles above ground, as funds become available in operational budgets in timing with maintenance and replacement schedules and occasionally through external resources, the utilities are seeking to place remaining hard lines---phone, cable, electrical---underground. The INET system connects county agencies using underground fiber optic cables. Coordinated among the participants of the Kaua'i County Utility Preparedness and Response Group.
- 12) ***Implementing Debris Removal Plan*** – Development of a debris removal plan for disasters to ensure that solid waste is properly sited and does not create contamination

- 13) **Implementing Wastewater Facility Plans**- Plans have been developed to upgrade wastewater systems. The plans detail potential impacts from flood and tsunami. They further consider socioeconomic risks to communities relevant to hazard impacts. Coordinated by the Department of Public Works Wastewater Division.
- 14) **Improving Flood Plain Ordinance** – In 2005, the Kaua'i County Flood Ordinance was improved. The most recent revision to Chapter 15, Article 1 of the Kaua'i County code was adopted September 9, 2005. The 2005 update includes mandatory language previously missing from the ordinance, and higher standard regulations that exceed the minimum NFIP requirements. These higher standards include, but are not limited to: §15-1.3 & 15-1.5 - “Repetitive Loss Structure” – new definition and development standards added. §15-1.3 & 15-1.5 - “Substantial Improvement” – a 10-year Cumulative Substantial Improvement (CSI) rule was added. To ensure that Kaua'i County's floodplain management ordinance remains in good standing with the NFIP, the County elected to include an automatic adoption clause that allows for the automatic adoption of any subsequent revisions and amendments (§15-1.2) to the Flood Insurance Rate Maps and Flood Insurance Study. Coordinated by the Department of Public Works.
- 15) **Improving Building Codes** – Conducted an analysis of uniform-risk wind speed maps in HAZUS and GIS format to improve planning and upgrading of building codes based on topographic wind speeds. Included wind field vectoring to establish the effect of large land masses on wind direction. Coordinated by the Department of Public Works Building Division with Martin & Chock, Inc.

## **7.2.2 Identification of a Comprehensive Range of Specific Mitigation Actions and Projects for each Hazard**

Kaua'i County has identified a series of actions that contribute to hazard mitigation and overall disaster risk reduction. The actions were suggested by county agencies, organizations, and community members through meetings and consultations. Projects requiring additional funds were solicited through the disaster mitigation committee (DMC) and reviewed for inclusion in the plan. The list of the following actions has been reviewed and recommended by the DMC for inclusion in the plan because they meet the overall goals and objectives of the county to strengthen their resiliency to disaster by promoting sustainable ways of life. As specified in Chapter 8, the list will be reviewed and updated annually to monitor progress.

As previously mentioned, the actions have been divided into those that can be conducted with existing resources and those that require additional resources. Estimated timelines have been included; however, these are subject to the constraints of economic pressure, limited staff, and competing mandates for action.

**Table 7-1. Kaua'i County Mitigation Actions.**

<b>Lead agency/ organization</b>	<b>Goals &amp; Objectives</b>	<b>Action Description Project Timeframe</b>
<b>Multi-Hazard Actions</b>		
<b>Incorporate into operations using existing resources</b>		
Office of the Mayor and Kaua'i Civil Defense	G1	Ensure widespread awareness for reducing disaster risks and mitigating impacts of hazards in policies, planning, and program implementation. <b>Estimated Time:</b> ongoing
Office of the Mayor, Planning Department, and Kaua'i Civil Defense	G1	Ensure hazard mitigation is incorporated into the Kauai County General Plan (ten-year plan, 2011-2020). <b>Estimated Time:</b> developed by 2011
Department of Public Works Building Division	G4 O1 G7 O1,2	For new construction of public buildings, designate areas to serve as a shelter. (Construction would require new resources; see specific requests for project funding for shelters). <b>Estimated Time:</b> ongoing
Kaua'i Civil Defense	G4 O2,3,5	Review and ensure agreements are in place among private utilities, the executive government agencies, Kaua'i Civil Defense (KCD), and the Red Cross to ensure that high priority facilities and shelters are maintained. <b>Estimated Time:</b> ongoing
Department of Public Works Building Division	G7 O1,2	Consider options to secure funds to retrofit facilities with hurricane shutters, roof tie-downs, and other improvements, such as emergency power generation equipment. <b>Estimated Time:</b> ongoing
Kaua'i Civil Defense & Economic Development Office	G4 O4,5 G7 O2	Continue to develop agreements with hotels and resorts to house their own guests and worker families during hurricanes and other major natural disasters. In Hawai'i, legislation enables private facilities to house the public with relief for negligence liability. Hawai'i Revised Statutes (HRS) 128-19 provides relief for negligence liability to private sector owners who volunteer the use of their facilities as an emergency shelter. The immunity protection that may be provided applies when an owner or controller of the facility meets the following criteria: (1) Their actions relating to the sheltering of people are voluntary; (2) They receive no compensation for the use of the property as a shelter; (3) They grant a license or privilege, or permit the property to be used to shelter people; (4) The Director of Civil Defense, or delegated agency or person, has designated the whole or any part of the property to be used as a shelter; (5) The property is used to shelter persons; and (6) The use occurs during an actual impending, mock, or practice disaster or attack. <b>Estimated Time:</b> ongoing
Kaua'i Civil Defense with civil society (Red Cross), Agency on Elderly Affairs, Human & Social Services	G4 O3	Identify special needs populations and sheltering requirements, and facilitate dialogue with key segments of the population to ensure that there are places for these populations to shelter and remain safe during disasters. For example, sheltering in place options may be preferred for mental health clinics with patients requiring specific medications and care, elderly care homes may have non-ambulatory patients, or domestic violence centers may have women who would be unsafe in another facility.

		<b>Estimated Time: 2013</b>
Kaua'i Civil Defense	G1 O1-5	Continue to develop plans that integrate national goals and initiatives into the County of Kaua'i plans for disaster risk management to ensure synergy in programs with limited resources and maximize benefits from disaster funding and required programmatic implementation. <b>Estimated Time: ongoing</b>
Kaua'i Civil Defense with the Office of Economic Development and State Department of Agriculture	G4 O2 G5 O4	Continue to encourage the integration of agricultural planning and coordination into disaster risk management community to improve local food security, sustainability, and community resilience to hazards. Food security is critical for coping with disasters where it may be weeks to receive goods and services on island, as Kauai experienced with Hurricane Inky in 1992, so it should be coordinated with sheltering activities and lifeline security. <b>Estimated Time: ongoing</b>
Kaua'i Civil Defense and Department of Planning	G1	Develop a post-disaster recovery plan that incorporates mitigation considerations to better enable mitigation objectives in rehabilitation and reconstruction, and to prevent additional problems from improper development, land use, or further environmental degradation during the chaos of post-disaster recovery. This will enable policies and programs to be identified ahead of time so that when a disaster occurs, time will not be wasted in determining the best course of action. <b>Estimated Time: 2015</b>
<b>Requires external funding or resources</b>		
Kauai County Planning Department	State Plan	Emergency By-Pass Road. To connect North Kauai with South Kauai in case Wailua River Bridge is compromised after a catastrophic event using existing cane haul roads and widening resurfacing gravel based finish and refurbishing south fork bridge crossing and north culvert ford crossing. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai County Office of Economic Development	State Plan	Energy Emergency Plan Update. To update the County EEP plan to be consistent with the State EEP Plan. <b>Proposed: 2009 Estimated Time: 9 months</b>
Kauai Fire Department	G1 O1 G3 O1	Command Vehicle & Portable Headquarters. To provide a secure area to perform incident command functions in the event of a disaster or major incident. This vehicle could also be used to maintain functionality of Fire Headquarters in the event that our permanent Headquarters is damaged. (COOP Plan). Critical public safety operations will be able to continue, allowing first responders and other public safety employees to assist the community and themselves during crises <b>Proposed: 2009 Estimated Time: 9 months</b>
Kauai Fire Department	G3 O1	Handheld Portable Radio for Every First Responder. Providing a handheld portable radio for each 1st Responder helps ensure their safety while responding to hazardous conditions. Everyone will immediately receive the evacuate notice or other types of warnings without having the delay of waiting for the person with the radio to notify them. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai County Planning	State Plan	Emergency Permitting Procedures. Funding to hire a consultant for the study of emergency permitting regulations and procedures that could

Department		be enacted after a hazard event. A study and recommendation based on analysis of other counties and municipalities administrative rules for emergency permitting. <b>Proposed: 2009 Estimated Time: 2 years</b>
Kauai Island Utility Cooperative	G1 O6	Harden Electrical Distribution Supply to Kauai Veterans Memorial Hospital. <b>Proposed: 2004</b>
Kauai Island Utility Cooperative	G1 O1 G3 O1	Provide Emergency Electrical Backup Supply to customers in Kokee area. <b>Proposed: 2004</b>
<b>Hurricane and Strong Winds</b>		
<b>Incorporate into operations using existing resources</b>		
Department of Public Works Building Division	G1 O2 G6 O4 G7 O1,2	Integrate information about wind risks into mapping, planning, and improvements in local building codes. Probabilistic wind speed hazard microzonation maps incorporate topographic speed-up effects appropriate for structural design codification. The wind speed maps have been used to develop hurricane loss estimation models. This information should be taken into consideration in building development and retrofits. <b>Estimated Time: ongoing</b>
<b>Requires external funding or resources</b>		
Kauai County Office of Economic Development	G4 O2, 3	Certify hotels and condominium units as official shelters. Set up and hold training and certification programs around the islands for the hotels, timeshare, condominiums, vacation rentals and bed and breakfast units to educate them on how to harden, retrofit and build safe rooms for sheltering. Extensive benefit to visitor industry to be able to provide shelter. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai County Office of Economic Development	G1 O1 G3 O1	Emergency Generation for Lihue Town Core Government District. Project to provide emergency power generation (about 1 mW) for the Lihue Town Core Government District so all County and State support agencies can be operational immediately after a major disaster. <b>Proposed: 2009 Estimated Time: 3 months</b>
Kauai County Office of Economic Development	G1 O1 G3 O1	Emergency Generation for County Facilities. Project to provide emergency power generators for County facilities so they can be operational immediately after a disaster. Existing generators are vintage 1990 era units and need to be replaced. Many facilities do not have backup generation so facilities and operations cannot be used during and after disasters. Lihue Civic Center complex is not included in this proposal. Facilities include but are not limited to the Police/Civil Defense facility, transportation baseyard, neighborhood centers, wastewater treatment facilities, automotive baseyard and refuse transfer stations. Program includes an ongoing maintenance program to keep generators functional and in good condition and a quick-connect reconfiguration of the facility's electrical system to accommodate the generator hookup. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai County Housing Agency	G1 O1 G3 O1	Hardening of Kalepa Village. To update the County EEP plan to be consistent with the State EEP Plan. Provides plan to address disaster situations and market disruptions, and to hasten economic recovery. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai County	G1 O1	Hardening of Paanau Village. Provide exterior sheathing to increase

Housing Agency	G3 O1	wall strength, harden windows, doors and glass doors and/or provide hurricane shutters to reduce structural failures in the event of a hurricane. Provides 60 families with a secure facility and reduces impact on Koloa area shelters. <b>Proposed: 2009 Estimated Time: 9 months</b>
Kauai Fire Department	G3 O1 G7 O1,2	Hardening the generator room and LP tanks at every fire station on Kauai will ensure that 1 <sup>st</sup> responders have power for communications and the ability to operate equipment during any type of hazardous conditions. <b>Proposed: 2009 Estimated Time: 3 years</b>
Kauai County Office of Economic Development	State Plan	Emergency Kits for County Agencies and Training Program. Provide emergency kits for County agencies that contain key items required in emergencies, with the proper training to use the various supplies and equipment. Kits would be on hand for use by County personnel and to respond to public requests for assistance. <b>Proposed: 2009 Estimated Time: 9 months</b>
Kauai County Office of Economic Development	State Plan	Community Education & Hazard Publication Distribution. Purchase and distribute University of Hawaii, Sea Grant publications, Purchasing Coastal Real Estate in Hawaii ( <a href="http://hawaii.gov/dlnr/occl/manuals-reports/Purchasing%20Coastal%20Real%20Estate.pdf">http://hawaii.gov/dlnr/occl/manuals-reports/Purchasing%20Coastal%20Real%20Estate.pdf</a> ) and Homeowner's Handbook to Prepare for Natural Hazards at any opportunity, including community meetings, annual Contractor's Expo, County Fair and the front counter of the Planning Department. <b>Proposed: 2009 Estimated Time: continuous</b>
Kauai County Office of Economic Development	G3 O1	SATPHONES for Emergency Coordination of Business, Government and Private Sector Post-Disaster. Purchase of 20 Satellite phones for use during emergencies when there is little communication ability. SATPHONES would be located at predetermined areas around the island including several on the North, West, South and East shores as well as exit locations such as the airport and with those coordinating essential communication between business, government and community after the emergency event. <b>Proposed: 2009 Estimated Time: 4 months</b>
Kauai County Office of Economic Development	G1 O4	COOP Training for Kauai's Visitor and Business Industry (Continuity of Operations Planning). Trainers would travel around the island to work with the visitor and business industry to build or update their COOP plan. Topics would include but not be limited to: plan what to do if your building, plant or store is not accessible, plan for payroll continuity, put a team together to be active members on behalf of your company as the emergency management team, develop relationships with other businesses in the area to support each other, define crisis management procedures, talk with first responders, emergency managers, etc. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department	G7 O1,2	Construct Safe Rooms at Every Fire Station. Construction of a safe room at every fire station on Kauai where 1st responders can wait out hazards such as a hurricane to ensure their ability to respond and help save lives once the immediate danger has passed. <b>Proposed: 2009 Estimated Time: 5 years</b>
Kauai Fire Department	G7 O1,2	Replace Generator at Every Fire Station. Replacing the generator at every fire station on Kauai will ensure that 1st responders have power for communications and the ability to operate equipment during any

		type of hazardous condition. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department		Purchase of 16' rigid hull boat with outboard motor would give KFD the ability to rescue people stranded near rivers or in the ocean. During or directly following a hurricane, heavy rainfall, dam breach, coastal inundation, erosion, wildfires, landslides, earthquakes or tsunamis, we would have the ability to search and rescue, assess situations, and transport victims from remote areas only accessible by rivers or ocean. <b>Proposed: 2009 Estimated Time: 3 months</b>
Department of Public Works, Building Division	G1 O1 G1 O3	Hardening of the Historic County Building. <b>Proposed: 2004 Funds Pending Estimated Time: 1 year</b>
Department of Public Works, Building Division	G1 O3	Hardening of the Kapule Building. <b>Proposed: 2004 Estimated Time: 1 year</b>
Kauai Island Utility Cooperative	G1 O1, 2	Install Photovoltaic Systems at Emergency Shelters. <b>Proposed: 2004 Estimated Time: 1 year</b>
<b>Floods</b>		
<b>Incorporate into operations using existing resources</b>		
Department of Public Works Engineering – Flood Plain Management	G1 O4	County of Kaua'i is already addressing compliance with NFIP as required. This policy recommendation is that attention to NFIP continues. Since Kaua'i has recently been mapped digitally as part of FEMA's Map Modernization Program, there should be continued attention to reducing flood risks, especially in areas that have revealed frequent or repetitive flooding. <b>Estimated Time: ongoing</b>
Department of Public Works Engineering – Flood Plain Management	G1 O4 G6 O4	Work with the State NFIP coordinator to develop the program for participation in the Community Rating System. The County of Kaua'i has developed new online digital tools to aid the public in understanding flood risks and has participated in the development of the updated hazard mitigation plan. The activities for reducing flood risks would contribute to the points needed for participating in the Community Rating System (CRS), and the County is exploring ways to engage in CRS so that flood insurance rates would decrease for residents. The Community Assistance Visit (CAV) has been requested for this purpose. <b>Estimated Time: 2013</b>
Department of Public Works Engineering – Flood Plain Management with Kaua'i Civil Defense	G2 O1,2	Ensure public awareness of flood risks and ways to mitigate flood hazards, including participation in the National Flood Insurance Program. NOAA has developed a dashboard web-based tool that looks at all stream gauges/data in real time to help emergency managers make assessments/decisions regarding flood incidents. This tool is scheduled for delivery by 2011. <b>Estimated Time: ongoing</b>
<b>Requires external funding or resources</b>		
Kauai County Office of Economic Development	G4 O2, 3	Certify hotels and condominium units as official shelters. Set up and hold training and certification programs around the islands for the hotels, timeshare, condominiums, vacation rentals and bed and breakfast units to educate them on how to harden, retrofit and build safe rooms for sheltering. Extensive benefit to visitor industry to be

		able to provide shelter. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai County Office of Economic Development	G1 O4	COOP Training for Kauai's Visitor and Business Industry (Continuity of Operations Planning). Trainers would travel around the island to work with the visitor and business industry to build or update their COOP plan. Topics would include but not be limited to: plan what to do if your building, plant or store is not accessible, plan for payroll continuity, put a team together to be active members on behalf of your company as the emergency management team, develop relationships with other businesses in the area to support each other, define crisis management procedures, talk with first responders, emergency managers, etc. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department	County Plan	Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai Fire Department	G7 O1,2	Construct Safe Rooms at Every Fire Station. Construction of a safe room at every fire station on Kauai where 1st responders can wait out hazards such as a hurricane to ensure their ability to respond and help save lives once the immediate danger has passed. <b>Proposed: 2009 Estimated Time: 5 years</b>
Kauai Fire Department	G7 O1,2	Replace Generator at Every Fire Station. Replacing the generator at every fire station on Kauai will ensure that 1st responders have power for communications and the ability to operate equipment during any type of hazardous condition. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department		Purchase of 16' rigid hull boat with outboard motor would give KFD the ability to rescue people stranded near rivers or in the ocean. During or directly following a hurricane, heavy rainfall, dam breach, coastal inundation, erosion, wildfires, landslides, earthquakes or tsunamis, we would have the ability to search and rescue, assess situations, and transport victims from remote areas only accessible by rivers or ocean. <b>Proposed: 2009 Estimated Time: 3 months</b>
Kauai County Planning Department	State Plan	Hire consultant to update and create DEM data layers. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai Civil Defense Agency	G1 O3	Waialua Bridge Pass. <b>Proposed: 2004</b>
Kauai Island Utility Cooperative	G1 O1, 2	Install Photovoltaic Systems at Emergency Shelters. <b>Proposed: 2004</b>
<b>Drought</b>		
<b>Incorporate into operations using existing resources</b>		
Kaua'i Civil Defense and Department of Finance Information Technology GIS	G1 G2 G6	To account for microclimates in Hawai'i, it is important to include rain gauges from all sources (federal and local) to ensure spatial rain gauge coverage so that the resulting maps are truly useful and representative. The rainfall data are from numerous local volunteer observers, such as sugar plantations, ranchers, pineapple companies, and individuals. The gauges provide good coverage of most of Kaua'i.

working with agriculture organizations		Combining the County and federal networks would yield the optimal spatial coverage for analysis. Further GIS based impact analysis using the improved data should be performed. <b>Estimated Time:</b> ongoing
Kaua'i Civil Defense and the Water Department	G1 O4 G6 O3	Improve data gathering and accounting for risk and vulnerability assessments for drought and wildfires. Integrating information on the risk and vulnerability specifically for Kaua'i County would be beneficial for planning by water resource managers, planners, and land use managers. <b>Estimated Time:</b> 2013
Kaua'i Civil Defense and the Water Department	G1	Implement the County drought mitigation strategies. Currently, drought mitigation plans exists for the State of Hawai'i and the County of Kaua'i. The plans need to be implemented at a local level, and updated regularly to address new needs. <b>Estimated Time:</b> 2013
<b>Requires external funding or resources</b>		
Kauai Fire Department		Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai DOW	G1 O3	Emergency Interconnection-DOW Koloa Water System-Grove Farm Koloa System. <b>Proposed: 2004</b>
Kauai DOW	G1 O3	Emergency Interconnection-Kekaha Sugar System and DOW Kekaha Water System. <b>Proposed: 2004</b>
DOFAW, Grove Farm, Knudsen Trust, lessees, Kahili Adventist School	G4 O2, 4	Emergency Water Supply Measures for Mahaulepu-Kipu-Haiku-Kahili. <b>Proposed: 2004</b>
Kauai DOW, U.S. Department of Defense, private irrigation systems	G5 O2, 4	County-Wide Conservation and Education Program. <b>Proposed: 2004</b>
DOFAW	G5 O2, 4	Fire Prevention Education and Outreach. <b>Proposed: 2004</b>
Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW)	G1 O5 G2 O5 G5 O4	Installation of Remote Automatic Weather Stations. <b>Proposed: 2004</b>
DHHL, DOFAW	G1 O3	Maintain and Expand Fire breaks at Anahola. <b>Proposed: 2004</b>
Kauai Coffee Co., Kauai Fire Department, DOFAW	G4 O2, 4	Upgrade and Maintain Pump 3 ditch system and Alexander Reservoir. <b>Proposed: 2004</b>
DLNR, Gay & Robinson	G4 O2, 4	Maintenance and Upgrade of the Kekaha ditch system. <b>Proposed: 2004</b>

DHHL, land owners	G4 O2, 4	Repair, Maintain and Reestablish the Anahola ditch system. <b>Proposed: 2004</b>
Kauai DOW	G1 O3	Kekaha Amfac Shaft Renovation and Replacement Pipeline, Kekaha Water System. <b>Proposed: 2004</b>
DOFAW, Dept of Hawaiian Home Lands (DHHL), State Parks Division, Agriculture Development Corp	G1 O3	Maintain Kokee Ditch system and reservoirs (Puulua, Kitano, Puuopae) <b>Proposed: 2004</b>
DOFAW	G1 O3	Roadside fuel treatments. <b>Proposed: 2004</b>
DLNR Parks Division	G1 O3	State Kokee System Wells: Develop deeper ground water wells. <b>Proposed: 2004</b>
<b>Wildfire</b>		
<b>Incorporate into operations using existing resources</b>		
Fire Department, Kaua'i Civil Defense, and Department of Finance Information Technology GIS	G6	Use historical wildfire occurrence maps to identify hot-spots and provide a better planning tool for allocating resources and developing mitigation strategies to reduce incidence of wildfire. <b>Estimated Time: 2012</b>
Fire Department	G2 G3 O4,5	Engage in public education programs with schools and communities. These programs include: 1) Smokey Bear material/fire prevention radio and TV spots; 2) Talks to schools, civic organizations, etc.; 3) Public notices/news releases declaring high fire danger periods; and, 4) Posting of fire prevention/high fire danger warning signs and posters. <b>Estimated Time: ongoing</b>
Kaua'i Civil Defense with Fire Department and State Department of Land and Natural Resources	G1 G6	Identify and reduce hazardous fuels. Identify areas with potentially hazardous fuels. Reduce "flash" fuels in high use areas. Engage in programs for conversion of "flashy" fuels in high use areas. <b>Estimated Time: ongoing</b>
Planning Department, Kaua'i Civil Defense, and Fire Department	G1 G6	Minimize fires through land use policies and control. Determine appropriate restriction of the general public use within a fire hazard. Encourage land use that reduces fire dangers, such as vegetation clearing and clean-up programs. Require fire plans for all appropriate land use activities within the DLNR Department of Forestry & Wildlife's Management jurisdictions. <b>Estimated Time: ongoing</b>
<b>Requires external funding or resources</b>		
Kauai Fire Department	G7 O1 ,2	Portable water tanks for wildfire operations. To provide alternative water supply for rural communities in the event of an emergency. To provide alternative resources to accomplish Fire Department objectives. <b>Proposed: 2009</b>
Kauai Fire Department		Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster.

		<b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai Fire Department		Purchase of 16' rigid hull boat with outboard motor would give KFD the ability to rescue people stranded near rivers or in the ocean. During or directly following a hurricane, heavy rainfall, dam breach, coastal inundation, erosion, wildfires, landslides, earthquakes or tsunamis, we would have the ability to search and rescue, assess situations, and transport victims from remote areas only accessible by rivers or ocean. <b>Proposed: 2009 Estimated Time: 3 months</b>
Kauai Fire Department	G7 O1	Water tenders to provide critical resources in our rural environment and to provide an alternative water supply. <b>Proposed: 2009 Estimated Time: 6 months</b>
DOFAW	G5 O2, 4	Fire Prevention Education and Outreach. <b>Proposed: 2004</b>
Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW)	G1 O5 G2 O5 G5 O4	Installation of Remote Automatic Weather Stations. <b>Proposed: 2004</b>
DHHL, DOFAW	G1 O3	Maintain and Expand Fire breaks at Anahola. <b>Proposed: 2004</b>
DOFAW, Dept of Hawaiian Home Lands (DHHL), State Parks Division, Agriculture Development Corp	G1 O3	Maintain Kokee Ditch system and reservoirs (Puulua, Kitano, Puuopae) <b>Proposed: 2004</b>
DOFAW	G1 O3	Roadside fuel treatments. <b>Proposed: 2004</b>
<b>Climate Variability and Change</b>		
<b>Incorporate into operations using existing resources</b>		
Planning Department	G1	Take into consideration the impacts of climate change (higher temperatures, sea level rise, extremes in rainfall as floods or drought, and potential increases in tropical storm frequency or severity) in land use, development, and planning. <b>Estimated Time: ongoing</b>
All departments, working with community organizations and private sector	G1	Take into consideration potential socioeconomic impacts from climate change for Kaua'i. Many sectors will be impacted by climate change: water resource management, disaster risk management, public health, agriculture, and tourism. Impacts will be felt first in communities, and sustainability of these communities should be considered. <b>Estimated Time: ongoing</b>
Kaua'i Civil Defense, Water Department, and Planning Department	G2	Educate leaders and the public about sea level rise, increased disaster risks, and ecosystem impacts from climate change that will ultimately affect the livelihood of the people in Kaua'i. The findings of scenarios and assessments (especially those conducted by State and Federal partners in risk management) should be integrated into county policies. <b>Estimated Time: 2014</b>
<b>Requires external funding or resources</b>		
Kauai County Office of Economic Development	G2	Sea Level Rise Inundation Maps. Building constructed to today's standards and those occupants will be in jeopardy or loss due to elevated flood waters and storm surge. <b>Proposed: 2009 Estimated Time: 1 year</b>

<b>Earthquake</b>		
<b>Incorporate into operations using existing resources</b>		
Department of Public Works Building Division	G1 G6 O1	Integrate HAZUS loss modeling information on structural risk and vulnerability with GIS to upgrade building codes, consistent with State adoption of codes with hazard amendments including seismic classification mapping. <b>Estimated Time: 2013</b>
Kaua'i Civil Defense	G4	Review the delineation potential earthquake-induced landslide hazard areas. The emphasis would be on potential hazards impacting structures, roadways, and lifelines, where seismically induced slope instability is significant. The data collected during this study will be used to generate "potential hazard" maps, which could be used to identify already developed as well as future building or development sites that may warrant further evaluation. <b>Estimated Time:2013</b>
Department of Public Works Building Division	G2 G7 O3	Participate in State training and assistance in the use of modern codes and retrofit guidelines for county officials and design professionals. Encourage sponsorship and collaboration in training with the Contractors' Association of Kauai. <b>Estimated Time:2013</b>
<b>Requires external funding or resources</b>		
Kauai Fire Department		Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai Fire Department	G3 O1 G7 O1,2	Hardening the generator room and LP tanks at every fire station on Kauai will ensure that 1 <sup>st</sup> responders have power for communications and the ability to operate equipment during any type of hazardous conditions. <b>Proposed: 2009 Estimated Time: 3 years</b>
Kauai Fire Department	G7 O1,2	Construct Safe Rooms at Every Fire Station. Construction of a safe room at every fire station on Kauai where 1st responders can wait out hazards such as a hurricane to ensure their ability to respond and help save lives once the immediate danger has passed. <b>Proposed: 2009 Estimated Time: 5 years</b>
Kauai Fire Department	G7 O1,2	Replace Generator at Every Fire Station. Replacing the generator at every fire station on Kauai will ensure that 1st responders have power for communications and the ability to operate equipment during any type of hazardous condition. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department		Purchase of 16' rigid hull boat with outboard motor would give KFD the ability to rescue people stranded near rivers or in the ocean. During or directly following a hurricane, heavy rainfall, dam breach, coastal inundation, erosion, wildfires, landslides, earthquakes or tsunamis, we would have the ability to search and rescue, assess situations, and transport victims from remote areas only accessible by rivers or ocean. <b>Proposed: 2009 Estimated Time: 3 months</b>

<b>Tsunami</b>		
<b>Incorporate into operations using existing resources</b>		
Kaua'i Civil Defense	G1 G6 O1,3	Use Tsunami Modeling and Evacuation Planning for Kaua'i conducted by the Army Corps of Engineers, to update evacuation route planning and maps in the Chapter 3 appendix, and to inform land use planning and development. In light of lessons learned from recent nearshore tsunami in Samoa, these maps should be reviewed for Kaua'i and updated. These should inform development planning efforts to prevent extensive development in areas of high inundation risks or to consider securing funds for constructing vertical evacuation routes or structures in low-lying areas. <b>Estimated Time: 2013</b>
<b>Requires external funding or resources</b>		
Kauai County Office of Economic Development	State Plan	Community Education & Hazard Publication Distribution. Purchase and distribute University of Hawaii, Sea Grant publications, Purchasing Coastal Real Estate in Hawaii ( <a href="http://hawaii.gov/dlnr/occl/manuals-reports/Purchasing%20Coastal%20Real%20Estate.pdf">http://hawaii.gov/dlnr/occl/manuals-reports/Purchasing%20Coastal%20Real%20Estate.pdf</a> ) and Homeowner's Handbook to Prepare for Natural Hazards at any opportunity, including community meetings, annual Contractor's Expo, County Fair and the front counter of the Planning Department. <b>Proposed: 2009 Estimated Time: on-going</b>
Kauai Fire Department	G3 O1 G7 O1,2	Hardening the generator room and LP tanks at every fire station on Kauai will ensure that 1 <sup>st</sup> responders have power for communications and the ability to operate equipment during any type of hazardous conditions. <b>Proposed: 2009 Estimated Time: 3 years</b>
Kauai Fire Department		Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster. <b>Proposed: 2009 Estimated Time: 6 months</b>
Kauai Fire Department	G7 O1,2	Construct Safe Rooms at Every Fire Station. Construction of a safe room at every fire station on Kauai where 1st responders can wait out hazards such as a hurricane to ensure their ability to respond and help save lives once the immediate danger has passed. <b>Proposed: 2009 Estimated Time: 5 years</b>
Kauai Fire Department	G7 O1,2	Replace Generator at Every Fire Station. Replacing the generator at every fire station on Kauai will ensure that 1st responders have power for communications and the ability to operate equipment during any type of hazardous condition. <b>Proposed: 2009 Estimated Time: 1 year</b>
Kauai Fire Department		Purchase of 16' rigid hull boat with outboard motor would give KFD the ability to rescue people stranded near rivers or in the ocean. During or directly following a hurricane, heavy rainfall, dam breach, coastal inundation, erosion, wildfires, landslides, earthquakes or tsunamis, we would have the ability to search and rescue, assess situations, and transport victims from remote areas only accessible by rivers or ocean. <b>Proposed: 2009 Estimated Time: 3 months</b>
Kauai Island Utility	G1 O1, 2	Install Photovoltaic Systems at Emergency Shelters. <b>Proposed: 2004</b>

Cooperative		
<b>Volcano/Vog</b>		
<b>Incorporate into operations using existing resources</b>		
County Public Health	G2 O3	Develop education programs with an early warning system to reduce impacts from “vog” or airborne environmental risks consistent with information distributed by the State. The volcanic haze, which comes often when tradewinds are not present, can cause headaches and respiratory illness. Warnings can help to reduce exposure to the risk. <b>Estimated Time: 2012</b>
<b>Landslides/Mudslides</b>		
<b>Incorporate into operations using existing resources</b>		
Kaua’i Civil Defense, Department of Public Works, and Transportation with State DOT	G1 G4 G6 O3	Develop policies for identifying and mitigating landslide hazards and risks to communities for isolation. Identify and implement mitigation of landslide hazard risks to State Highways in Kaua'i. The State Department of Transportation Highways Division, including the Highways Division based in Kaua'i has been struggling to mitigate landslides on critical highway areas. <b>Estimated Time: 2014</b>
<b>Requires external funding or resources</b>		
Kauai Fire Department		Purchase of Helicopter. Having a county owned helicopter to be able to provide assistance in rescuing stranded individuals. It will also result in faster response times and provide aerial assessments of the damaged areas after a major disaster. <b>Proposed: 2009 Estimated Time: 6 months</b>
<b>Erosion</b>		
<b>Incorporate into operations using existing resources</b>		
Planning Department	G1 O4 G6 O4	Develop a Shoreline Certification based on the shoreline geology for each shore segment. Recent shoreline mapping in Kaua'i will enable recommendations for shoreline certification to be based on quality data. <b>Estimated Time: 2012</b>
Planning Department	G1 O4	Develop county erosion mitigation plans. The erosion studies should be used to develop erosion management and mitigation plans that sync with the state plan, COEMAP, at the county level. The counties are responsible for issuing permits for shoreline development, and it is important that erosion mitigation and beach and dune protection measures be implemented at the county level. The recent shoreline studies in Kaua'i should be used to inform the development and implementation of a Kaua'i erosion management plan. <b>Estimated Time: 2013</b>
<b>Dam Safety</b>		
<b>Incorporate into operations using existing resources</b>		
Department of Public Works	G1 O4 G5 O1,4	Participate in the inspection, repair, and maintenance of dams and levees. The County should work with State and Federal agencies to secure resources for repair and maintenance of dams and levee systems to reduce potential disasters. <b>Estimated Time: ongoing</b>
Department of Public Works and Kaua’i Civil Defense	G2 O3	Educate and inform public living downstream of dams about potential dam break risks and identify evacuation routes. Using the risk maps that have been developed about dams in Kaua'i it is possible to identify areas at greatest risk from dam breaches. The residents of the areas at risk should be targeted with public awareness campaigns

		and evacuation protocols should be established to ensure safety. Evacuation plans for Kaua'i dams are being developed in coordination with KPD, Public Works, DLNR's Dam Safety Division, and the Pacific Disaster Center. Final plans should be available by the end of 2011. <b>Estimated Time:</b> 2012
<b>Hazardous Materials</b>		
<b>Incorporate into operations using existing resources</b>		
Department of Public Works	G5	Collection of household hazardous waste materials is done on an annual basis for all residents of Kaua'i. This includes but is not limited to batteries, paint, pesticides, chemicals and other hazardous materials. The County has a comprehensive hazardous waste disposal program for County-generated waste. <b>Estimated Time:</b> Current and ongoing
Kaua'i Civil Defense and Fire Department	G1 O4	Identify areas of hazardous materials that could pose additional risks in hurricanes, tsunami, severe flooding, coastal inundation, and other hazards, and determine ways to mitigate these risks. <b>Estimated Time:</b> 2013
<b>Homeland Security and Human-Induced Hazards</b>		
<b>Incorporate into operations using existing resources</b>		
Kaua'i Civil Defense	G 5 G7 O1,2	The Critical Infrastructure Program (CIP) needs to be integrated with hazard mitigation programs in the county, hazardous materials management in the Department of Health, and localized for protection at the county level. <b>Estimated Time:</b> 2014
Kaua'i Civil Defense	G2 O2,3	Engage in public education, outreach, and partnerships. With limited staff in local agencies, agencies must be ready to deal with every aspect of disaster management. Partnering includes developing relationships with non-traditional institutions, agencies, commissions, retail, etc., and also working through the volunteer agencies to ensure the citizens and business are integrated with the emergency management community. <b>Estimated Time:</b> ongoing
Finance Department – Information Technology	G1 O4 G3 G6 O2,4,6 G7	Secure cyber information and technology, which are critical to support of economy, lifelines, and government operations. The potential damage and financial losses from a cyber attack would devastate the economic infrastructure. Information technology is very important in sharing of data and information in the areas of law enforcement, emergency preparedness, shelter operations, volunteer management, resource management, and in reality every aspect of operations – technology enhancements improvements are imperative. <b>Estimated Time:</b> ongoing
Kaua'i Civil Defense	G O	Enhance the multi-hazards exercise and training programs to ensure integrated risk reduction for hazards that considers additional threats. The primary strategy is to conduct exercises as actual events. The gaps in the exercises should be evaluated to suggest improvements in response and recovery actions and pose additional mitigation measures. <b>Estimated Time:</b> ongoing
<b>Health-Related Disasters</b>		
<b>Incorporate into operations using existing resources</b>		
Kaua'i Civil	G1 O4	Plan and prepare for Pandemic Flu Risks working with the State

Defense	G5	Department of Health, county hospitals, and the school system. Develop plans and protocols to minimize spread of pandemic flu and to ensure continuity of government and health facility operations in an event. Kaua`i Civil Defense is also a partner of the City and County of Honolulu in their Regional Catastrophic Planning Grant focusing on pandemic flu planning. A Regional-specific plan will be produced by the end of 2010. <b>Estimated Time: 2011</b>
Kaua`i Civil Defense	G1 O4	Advocate research to understand the links between health and climate change, and disaster risk. Following a disaster or extreme climate event, such as a hurricane or drought, the public is at risk from water-borne diseases, including gastrointestinal diseases and cholera. Additional threats occur from increased temperatures related to heat stroke. There are links in diseases such as malaria, dengue, and leptospirosis from extremes in flooding and drought. These considerations need to be built into the public health programs in Kaua`i. Planning should include consideration of the amounts of medicines and medical resources that may be needed during climate extremes. <b>Estimated Time: ongoing</b>
<b>Requires external funding or resources</b>		
Kauai Island Utility Cooperative	G1 O6	Harden Electrical Distribution Supply to Kauai Veterans Memorial Hospital. <b>Proposed: 2004</b>
Kauai Civil Defense Agency	G1 O3	Waialua Bridge Pass. <b>Proposed: 2004</b>

## 7.3 Identification and Analysis of Mitigation Actions: NFIP Compliance

### 7.3.1 Description of adoption and enforcement of floodplain management requirements, including regulatory and inspection practices in Special Flood Hazard Areas

The County of Kaua'i is a participating community in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). The County's Department of Public Works has the responsibility for administering the NFIP within their jurisdiction. The County's floodplain manager, Mr. Mario Antonio is a registered Professional Engineer and a Certified Floodplain Manager.

The County entered the Regular phase of the NFIP on November 4, 1981. As a condition of participation in the NFIP program, the County must adopt floodplain management regulations that meet the minimum regulations as set forth in Title 44 of the Code of Federal Regulations §60.3. The initial Floodplain Management regulations for the County, which recognized Special Flood Hazard Areas in accordance with the NFIP was adopted on 10/28/1981 (Ordinance No. 416, Bill No. 774 Draft 1).

The most recent revision to Chapter 15, Article 1 of the Kaua`i County code was adopted September 9, 2005. The 2005 update was required in include mandatory language that

was previously missing from the ordinance. However, the County took the opportunity to include higher standard regulations that exceed the minimum NFIP requirements. These higher standards include, but not limited to:

Section	Description
§15-1.3 & 15-1.5	“Repetitive Loss Structure” – new definition and development standards added.
§15-1.3 & 15-1.5	“Substantial Improvement” – a 10-year Cumulative Substantial Improvement (CSI) rule was added.

To ensure that Kaua’i County’s floodplain management ordinance remains in good standing with the NFIP, the County elected to include an automatic adoption clause that allows for the automatic adoption of any subsequent revisions and amendments (§15-1.2) to the Flood Insurance Rate Maps and Flood Insurance Study.

The State Coordinating Officer (SCO) initiated the most recent Community Assistance Visit (CAV) on 4/30/2003 and is still actively working with the County to resolve various administrative and enforcement procedures. As of October 2007, the additional documentation requested was not received and the SCO was forced to close the CAV with outstanding issues. Since that time, the SCO and FEMA RIX have been investigating potential violations in coastal areas of Kaua’i’s north shore communities and evaluating the effectiveness of the County permitting practices for floodplain development. The County has requested assistance from the Army Corps of Engineers to modify levees in Hanapepe and Waimea Rivers to meet FEMA’s levee certification requirements. On May 3, 2010, the County requested a CAV follow-up (letter included in Chapter 7 Appendix 3b, following the NFIP table). It is the intent of Kaua’i County to pursue setting up a community rating system (CRS).

### 7.3.2 Floodplain Identification and Mapping, including any Local Requests for Map Updates

On September 16, 2005, the Digital Flood Insurance Rate Maps (DFIRM) for Kaua’i became effective. These maps can be found at any one of the following sources:

County of Kaua’i Building Division	<a href="http://www.Kaua'i.gov/floodreview">www.Kaua’i.gov/floodreview</a>
Kaua’i Online Hazard Assessment Tool (KOHA)	<a href="http://csc-s-maps-q.csc.noaa.gov/khat/viewer.html">http://csc-s-maps-q.csc.noaa.gov/khat/viewer.html</a>
Hawaii Flood Hazard Assessment Tool (FHAT)	<a href="http://gis.hawaiiinfip.org/fhat/">http://gis.hawaiiinfip.org/fhat/</a>
FEMA Map Service Center	<a href="http://www.msc.fema.gov">www.msc.fema.gov</a>

Preliminary DFIRMs were issued to the County in May 2009. The proposed revisions are to incorporate FEMA’s Hurricane Flood Insurance Risk Study. These preliminary maps are available for review on the FHAT. A Letter of Final Determination is scheduled to be issued on May 26, 2010.

One of the changes to the Kaua'i County Floodplain Management Ordinance in 2005 to bring it in compliance with CFR 44 was the addition of language regarding repetitive loss structures. The additions had the effect of not allowing grandfathered unsubstantial improvement for repetitive loss structures but rather to force these structures to flood compliance.

### **7.3.3 Future Actions for NFIP in Kaua'i County**

#### **7.3.3.1 Flood Maps**

To ensure that Kaua'i County's floodplain management ordinance remains in good standing with the NFIP, the County elected to include an automatic adoption clause that allows for the automatic adoption of any subsequent revisions and amendments (§15-1.2) to the Flood Insurance Rate Maps and Flood Insurance Study. This measure permits updates and revisions to be adopted quickly.

#### **7.3.3.2 Repetitive Loss Property**

As mentioned the addition of language regarding repetitive loss structures to the Kaua'i County Floodplain Management Ordinance in 2005 to bring it in compliance with CFR 44, the updated ordinance does not allow grandfathered unsubstantial improvement for repetitive loss structures in order to force these structures to flood compliance. The ordinance enables the county to address future repetitive loss structures.

#### **7.3.3.3 Levee Certification Process**

Kaua'i County has requested assistance from the US Army Corps of Engineers in repairing levees to meet requirements in the certification process. (See Chapter 7 Appendix 7c, letter of request for assistance.) The request is to pursue modification of the levees at the Hanapepe and Waimea Rivers under Section 216 of the Flood Control Act of 1970, Modification of Existing Corps Projects. The Floodplain Coordinator has conducted public meetings to ensure that the communities are aware of the issues with certification. The county is working to address current and future issues.

#### **7.3.3.4 Community Rating System**

Kaua'i County has requested a Community Assistance Visit (CAV) from the NFIP Coordinator at the Department of Land and Natural Resources (DLNR) to help in establishing the community rating system in the county. (See letter of request in Chapter 7 Appendix 3b.)

## **7.4 Kaua'i County Project Prioritization**

In their focus on achieving the overall vision of the Mayor and the achievement of goals and objectives, the Disaster Mitigation Committee (DMC) has supported the mitigation actions that appear in this plan. Because of limited resources, personnel, and funding in the county, mitigation has become a part of the overall disaster risk management focus

of the county to achieve sustainable development and preserve the rural character of the island.

The criteria for determining inclusion in the plan were based on a series of practical questions:

- 1) **Effectiveness:** Will this project reduce hazard risks in the county?
- 2) **Focused:** Is the project supportive of the goals and objectives for mitigation?
- 3) **Feasible, Appropriate, and Equitable/Just:** If we apply a STAPLEE analysis, where we look at Social, Technical, Administrative, Political, Legal, Environmental, and Economic aspects of the proposed project, will this project be beneficial to the county?
- 4) **Beneficial and Cost-Effective:** Is there a greater benefit than cost ratio for the applied project? If not, is there an unaccountable social benefit for reducing risks that merit inclusion of the project in the plan?
- 5) **Achievable and Sustainable:** Will this mitigation action be achievable with local knowledge and resources or will external assistance be required? (Where external assistance is required, the efforts were separated in the list in Section 7.2 so that a funding strategy can be considered.)

The Disaster Mitigation Committee considered the range of projects for several types of hazards. The Disaster Mitigation Committee (DMC) reviewed the previous actions that were unfunded with the proposed mitigation actions solicited in 2009. The projects that were still unfunded, but were nonetheless needed to improve mitigation, were left on the list. These projects have been reviewed periodically. The only projects that moved off the list were those that had been funded, but not fully implemented. The DMC determined that the projects that had been proposed previously were still important for the county.

Through the Mayor's Office, projects were solicited from the government agencies through their executive branch representatives on the DMC. In Kaua'i, each member of the DMC and the broader community in Kaua'i, including council members, agency directors and staff members, disaster utilities subcommittee, and private sector and not-for-profit organizations received a copy of the hazard mitigation project proposal forms. The DMC reviewed the projects and made the determination as to whether it was a high-medium-low priority for the county and only listed those that were high and medium priorities. These projects that had a high and medium priority and require funding were included in Table 7-1 and in Table 7-2, which is the listing of projects that require funding and external assistance for implementation. The projects requiring funding proposed for 2010 have been included in Chapter 7 Appendix 1 for review (Note: these are included as an appendix with the intent to update the list of projects on an annual basis and to keep track of projects that receive funding).

The mitigation actions will be reviewed and new projects solicited by the DMC on an annual basis to ensure that the activities make sense for achieving hazard mitigation and risk reduction goals for the county.

In initiating the project proposals, each agency or organization considered the overall cost of the project, the benefit to preserving Kaua'i's critical facilities, and the overall benefit to people of Kaua'i County. Since there are mitigation actions in Table 7-1 that do not require additional resources or funding, these will be implemented as staffing and agency requirements permit. An initial consideration of the benefit-cost methodology was considered with the project proposals because the county wants to make sure that the benefits outweigh costs. If not, the funding could be better used on another mitigation activity. Since many of the projects are not eligible for FEMA funding, the FEMA Benefit-Cost Analysis tool has not been applied until the projects are proposed for consideration under the Pre-Disaster Mitigation Grant Program or the Hazard Mitigation Grant Program that is overseen by the State.

Since FEMA reviewers specified that projects needed to be prioritized as a required revision of the plan to get final approval, the DMC met and looked at the current issues facing Kauai to prioritize the list. The greatest hazard risks are still from hurricanes, tsunami, dam failure, and coastal inundation (from storms, sea level change, high wave events, and tsunami). There are chronic flood and erosion risks that the county is trying to address through development planning and communities are trying to mitigate through watershed management. The numerical prioritization that accompanies the list of projects requiring funding in Table 7-2 reflects the priorities for these particular proposed projects from 2009-2010. The list will be reviewed annually and updated according to the degree of success in achieving risk reduction, meeting goals and objectives, and providing the greatest benefit to the county in reducing risks.

Many of the proposed projects will benefit multiple sectors and address risks from multiple hazards. The Grants Officer in the Kauai Civil Defense Office will help to review and identify funding sources for the proposed projects in the plan, and work with the DMC and appropriate lead agencies to develop full proposals meeting requirements of each funding source. The determination for submission of external grants and resources will be based on availability of funding and additional criteria set forth by the sponsor. This process enables the county to take advantage of multiple funding sources, including those from multiple sources such as FEMA, USGS, USDA/NRCS, NOAA, State, and County budgets. In this period of economic downturn, Kaua'i County plans to consider all available resources that will contribute to reducing multiple hazard risks.

## **7.5 Implementation of Mitigation Measures**

Should funding be limited for implementation of mitigation measures, Kaua'i County is committed to encouraging mitigation planning through its everyday operations. This is the reason that Kaua'i County made careful consideration of the types of mitigation actions that can be achieved with the staffing, knowledge, and administrative resources

throughout the county, and included these actions in Table 7-1. The responsibility of the County agencies is to protect the safety of the residents, and commitment to improving the building and land use permit system by using the GIS database will help to minimize impacts from disasters. Projects that can be coordinated through partnerships and programs will also be considered, in order to maximize and synchronize efforts with similar goals to the hazard mitigation strategy.

Despite the constraints, Kaua'i County has implemented a number of mitigation measures and has demonstrated its commitment to hazard mitigation. Kaua'i County will continue to pursue opportunities to engage in partnerships with community and nonprofit organizations that will maximize limited financial resources and benefit the county by reducing risks to the impact of natural hazards.

**Table 7-2. Mitigation Actions and Measures in the County of Kaua'i, 2009**

Jurisdiction	Project Description	Hazards	Lead Agency	Budget	Funding Source	Priority	Goal	Corresponding Objective	Date Proposed	Status
Kaua'i	Hardening of Kalepa Village	Wind and Water	Kauai County Housing Agency	\$1.4 million	Federal (FEMA) grant, County Funds	HIGH	4	3	2009	N/A
							7	1		
Kaua'i	Hardening of Paanau Village	Wind	Kauai County Housing Agency	\$1 million	Federal (FEMA) grant, County Funds	HIGH	4	3	2009	N/A
							7	1		
Kaua'i	Emergency Generation for Lihue Town Core Government District	Wind	Kauai County Office of Economic Development	\$200,000	Federal (FEMA) grant, County Funds	HIGH	1	1	2009	N/A
							5	1		
							3	1		
Kaua'i	Emergency Kits for County Agencies and Training Program	Wind and Fire	Kauai County Office of Economic Development	\$50,000	Federal (FEMA) grant, County Funds	HIGH	1	1	2009	N/A
							2	1		
							7	1		
Kaua'i	Emergency Generation for County Facilities	Wind, Fire and Tsunami	Kauai County Office of Economic Development	\$750,000	Federal (FEMA) grant, County Funds	HIGH	1	1	2009	N/A
							3	1		
							5	1,3		
Kaua'i	Energy Emergency Plan Update	All	Kauai County Office of Economic Development	\$100,000	Federal (FEMA) grant, County Funds	HIGH	5	1	2009	N/A
Kaua'i	Community Education	Coastal Population	Kauai County Planning	\$10,000	Federal (FEMA)	HIGH	2	1,2	2009	N/A

Jurisdiction	Project Description	Hazards	Lead Agency	Budget	Funding Source	Priority	Goal	Corresponding Objective	Date Proposed	Status
	Hazard Publication Distribution		Department		grant, County Funds		3	4		
Kaua'i	Constraint District Data Layer	Coastal Properties	Kauai County Planning Department	\$50,000	Federal (FEMA) grant, County Funds	MEDIUM	6	1,4	2009	N/A
Kaua'i	Emergency Permitting Procedures	After hazard event permitting	Kauai County Planning Department	\$500,000	Federal (FEMA) grant, County Funds	MEDIUM	6	4	2009	N/A
Kaua'i	Emergency By-Pass Road	All	Kauai County Planning Department	\$2.75 million	Federal (FEMA) grant, County funds	HIGH	5	1,2,4	2009	N/A
							3	1		
Kaua'i	Inundation Maps due to Sea Level Rise	Water	Kauai County Planning Department	\$50,000	Federal (FEMA) grant, County Funds	HIGH	6	1,3	2009	N/A
Kaua'i	SAT phones for Emergency Coordination of Business, Government and Private Sector after disaster	Wind, Hurricane	Kauai County Office of Economic Development	\$70,000	Federal (FEMA) grant, County Funds	HIGH	3	1,3	2009	N/A

Jurisdiction	Project Description	Hazards	Lead Agency	Budget	Funding Source	Priority	Goal	Corresponding Objective	Date Proposed	Status
Kaua'i	COOP Training for Kauai Visitor Business Industry (Continuity of Operations Planning)	Wind and Flood	Kauai County Office of Economic Development	\$50,000	Federal (FEMA) grant, County Funds	HIGH	1	4	2009	N/A
Kaua'i	Certify Hotels and Condominium units as official shelters	Wind and Flood	Kauai County Office of Economic Development	\$70,000	Federal (FEMA) grant, County Funds	HIGH	4	2,3	2009	N/A
Kaua'i	16' Rigid Hull Boat with Outboard Motor	Erosion, Flood, Hurricane, Landslide, Seismic, Tsunami and Wildfire	Kauai Fire Department	\$50,000	Federal (FEMA) grant, County Funds	HIGH	5	1	2009	N/A
Kaua'i	Command Vehicle & Portable Headquarters	Critical to public safety operations – all hazards	Kauai Fire Department	\$700,000	Federal (FEMA) grant, County Funds	HIGH	1 & 3	1,1	2009	N/A
Kaua'i	Handheld Portable Radio for Every First Responder	All hazards	Kauai Fire Department	\$225,000	Federal (FEMA) grant, County Funds	HIGH	3	1	2009	N/A
Kaua'i	Harden Generator Room and LP Tanks at Every Fire Station	Flood, Hurricane, Seismic and Tsunami	Kauai Fire Department	\$220,500	Federal (FEMA) grant, County Funds	HIGH	3	1	2009	N/A
							7	2		

Jurisdiction	Project Description	Hazards	Lead Agency	Budget	Funding Source	Priority	Goal	Corresponding Objective	Date Proposed	Status
Kaua'i	Purchase of Helicopter to ensure faster response time for lifesaving	Drought, Flood, Landslide, Seismic, Tsunami, Wildfire	Kauai Fire Department	\$2,000,000	Federal (FEMA) grant, County Funds	HIGH	5	3	2009	N/A
Kaua'i	Portable water tanks for wildfire operations	Wildfire	Kauai Fire Department	\$20,000	Federal (FEMA) grant, County Funds	HIGH	7	1,2	2009	N/A
Kaua'i	Replace Generators at Every Fire Station	Flood, Hurricane, Seismic and Tsunami	Kauai Fire Department	\$70,000	Federal (FEMA) grant, County Funds	MEDIUM	7	1,2	2009	N/A
Kaua'i	Construct Safe Rooms at Every Fire Station	Flood, Hurricane, Seismic and Tsunami	Kauai Fire Department	\$2,100,000	Federal (FEMA) grant, County Funds	MEDIUM	7	1,2	2009	N/A
Kaua'i	Water Tenders to provide critical resources for Kauai's rural environment	Wildfire	Kauai Fire Department	\$150,000	Federal (FEMA) grant, County funds	MEDIUM	7	1	2009	N/A