

## CHAPTER 1:

# Introduction to Hazard Mitigation and Resilience in Kauaʻi

## 1.0 Introduction to the Hazard Mitigation and Resilience Plan

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000) the County of Kauaʻi has prepared the third local mitigation plan to retain eligibility for post-disaster funding. The purpose of these requirements is to have programs and projects in place that will help minimize the loss of life, property, and overall cost of disasters. The State plans and local mitigation plans must be updated every five years. This document provides an update to all sections of Kauaʻi County’s Multi-Hazard Mitigation & Resilience Plan (hereafter referred to as “Plan”), including hazard identification, asset identification, risk and vulnerability assessments, current mitigation activities and capabilities, the proposed mitigation strategy, and Plan maintenance to meet requirements set forth by DMA 2000. Moving beyond the requirements for hazard mitigation introduced in 2000, Kauaʻi County recognizes the importance of striving for resilience which will reduce risks to the population, economy, and communities.

DMA 2000 §201.6 (3) of the requirements outlines the process for localities in developing their mitigation strategies. Specifically, a Local Hazard Mitigation Plan must “include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.” These strategies are built on an assessment of hazard risks and vulnerabilities. The plans include measures to mitigate hazard risks and demonstrate the benefit of these activities. The Plan identifies gaps in knowledge and data and employ strategies to continually update the data, projects, information, and the overall mitigation Plan as needed over time.

The initial Hazard Mitigation Strategy for the County of Kauaʻi was based on findings of the hazard risk and vulnerability assessment and planning efforts supported by the Project Impact grant program. Given the impact of several disasters in Kauaʻi County since 2003, including a dam breach in Kaloko in 2006, flooding, and wildfires, there have been significant efforts undertaken prior to the 2009 Plan update. Since the approved Plan in 2010, Kauaʻi County has continued to pursue hazard mitigation efforts, and has strived to develop community resilience plans that take into account local capacities and knowledge for coping with threats.

For the 2015 update, we have undertaken an evaluation of the effectiveness of the previous implementation of the plans, updated the hazard risk maps for the county based on the criteria of the use of best available data, reviewed and updated the current goals and objectives for reducing hazards in Kauaʻi, and recommended policies, programs, and projects to reduce risks in line with these goals and objectives.

These efforts utilized the coordination and cooperation among government agencies and the private sector to learn from these hazards and address these risks in the future. This document

details the findings of these assessments and the process used to develop the County of Kaua'i Multi-Hazard Mitigation and Resilience Plan ("Plan").

## **1.1 Goals and Objectives for Risk Reduction and Resilience**

The Kaua'i County Disaster Management Committee (DMC) reviewed the goals and objectives from the previous plans. Many of the goals and objectives listed previously will be ongoing challenges in hazard mitigation, such as revising and updating the hazard mitigation Plan as required by FEMA and pursuing public awareness campaigns to ensure that all Kaua'i residents and visitors are aware of the potential hazards. For 2015-2020, the County recognizes the importance of focusing efforts on longer term goals of resiliency that ensure that the county will be able to withstand hazards and recover quickly when they occur.

The County recognized the importance of aligning this 2015 Multi-Hazard Mitigation and Resilience Plan with other initiatives in the County that promote resilient communities. In evaluating the implementation of the previous plans, it was also clear that there needed to be measures added to the goals and objectives that would make it easier to identify achievements and challenges, and to revise actions that would help to meet overall goals.

The primary alignment has been with the review of the Mayor's objectives for the county. During his Inauguration speech on December 1, 2010, Mayor Bernard P. Carvalho, Jr. outlined his vision for Kaua'i, called Holo Holo 2020, which calls for all organizations, businesses, residents and visitors on Kaua'i to be part of creating an island that is sustainable, values our native culture, has a thriving and healthy economy, cares for all – keiki to kupuna, and has a responsible and user-friendly local government. The Mayor's five areas of focus identified as part of this vision: Supporting our Economy; Becoming More Sustainable; Planning Wisely for our Future; Caring for our Community; and, Delivering Excellent Customer Service.

For the County of Kaua'i Multi-Hazard Mitigation and Resilience Plan, 2015 Update the goals and objectives have been aligned with the Vision, to ensure consistency with county plans. The goals and objectives have been reviewed and recommended for approval by the Mayor as part of the plan adoption process. Table 1-1 outlines the updated Goals and Objectives for 2015-2020, and demonstrates the support of the overall vision that promotes resilience.

**Table 1-1. Kaua'i County Multi-Hazard Mitigation and Resilience Goals and Objectives, 2015-2020.**

Goals	Objectives	MAYOR'S FIVE FOCUS AREAS				
		Supporting Our Economy	Becoming More Sustainable	Planning Wisely for Our Future	Caring for Our Community	Delivering Excellent Customer Service
1) Develop Disaster Resilient Communities	<p><b>Objective 1.1:</b> Develop local community disaster resilience plans.</p> <p><b>Measure:</b> Number of communities with an active disaster resilience plan.</p>		X	X		
	<p><b>Objective 1.2:</b> Identify risks and vulnerabilities to the local economy from hazards.</p> <p><b>Measure:</b> Identify economic threats from multiple hazards through RVA.</p> <p><b>Measure:</b> Identify risks to employment and livelihoods from disasters.</p> <p><b>Measure:</b> Number of businesses potentially impacted by hazard events.</p>	X				X
	<p><b>Objective 1.3:</b> Determine alternative livelihoods, economic options, and recovery strategies</p> <p><b>Measure:</b> Implement safeguards for business recovery (i.e., insurance, incentives to stay in Kaua'i, etc.).</p> <p><b>Measure:</b> Implement policies for risk-reduction rebuilding after disaster.</p>	X	X		X	
	<p><b>Objective 1.4:</b> Ensure availability of disaster-proof, affordable homes for Kaua'i residents</p> <p><b>Measure:</b> Implementation of improved building codes</p> <p><b>Measure:</b> Increase XX% affordable, improved homes</p>		X		X	
	<p><b>Objective 1.5:</b> Enhance local food and water capacity by encouraging growth and storage of local foods to reduce reliance on imported foods to support local recovery.</p> <p><b>Measure:</b> Increase XX% of locally grown food production.</p> <p><b>Measure:</b> Identification of safe local food and water storage in communities.</p>		X	X		
	<p><b>Objective 1.6:</b> Increase use of alternative energy systems.</p> <p><b>Measure:</b> Hardened systems (batteries, photovoltaic panels, etc.) against multiple hazard risks (primarily wind).</p> <p><b>Measure:</b> System redundancy - Availability of energy in communities from more than one source.</p> <p><b>Measure:</b> System redundancy - Availability of energy from more than one source for critical facilities (e.g. hospital, airport, harbor, water treatment plant) for continuity of services.</p> <p><b>Measure:</b> Systems are running following a disaster event with little or no time offline, and are able to be</p>		X	X		

	returned quickly.					
2) Reduce Disaster Risks through Planning and Implementing Hazard Mitigation Actions	<p><b>Objective 2.1:</b> Continue to Update the Multi-hazard Mitigation and Resilience Plan and Implement actions.  <b>Measure:</b> Approved Multi-Hazard Mitigation and Resilience Plan.</p>			X		X
	<p><b>Objective 2.2:</b> Identify, monitor, and support current and ongoing mitigation policies and activities in different sectors of county government and by hazard.  <b>Measure:</b> Document implementation of actions.  <b>Measure:</b> NFIP – CAV visit  <b>Measure:</b> Establish Community Rating System and reduce flood insurance costs for residents.</p>				X	
	<p><b>Objective 2.3:</b> Use the maps to identify risk and vulnerability to critical facilities and develop and prioritize risk reduction actions.  <b>Measure:</b> Document risk reduction for critical facilities.  <b>Measure:</b> DMC reviews and maintenance of actions</p>				X	X
	<p><b>Objective 2.4:</b> Evaluate risk reduction-relevant plans (on five year update cycle) and activities, and incorporate lessons into DRR policies and actions. Review goals and objectives annually to monitor implementation.  <b>Measure:</b> Review and support of community resilience plans and incorporation of actions  <b>Measure:</b> Review of county and state risk reduction-relevant plans, policies and measures and incorporation of actions and recommendations to the state mitigation plan</p>					X
	<p><b>Objective 2.5:</b> Align the General Plan update process with disaster risk reduction measures.  <b>Measure:</b> General Plan acknowledges hazard risks and identifies growth and development in areas of least harm or potential disaster impact.  <b>Measure:</b> Review of General Plan for risk reduction-relevant plans, policies and measures and incorporation of actions and recommendations</p>			X		X
	<p><b>Objective 2.5:</b> Ensure compliance with the National Incident Management System (NIMS) to ensure debris clearance, transportation, and security of critical lifelines and facilities in disasters.  <b>Measure:</b> Review After-Action reports for evacuation incidents (Hurricane Iselle); identify and address gaps.</p>				X	X
	<p><b>Objective 2.6:</b> 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.  <b>Measure:</b> Development of Community Resilience Plans</p>				X	
	<p><b>Objective 2.7:</b> Continue to secure, mitigate risk to, and maintain critical lifelines (infrastructure, utilities, etc.)</p>			X	X	X

	<p><b>Measure:</b> Number of mitigation actions in utilities and lifeline operation plans.</p> <p><b>Measure:</b> Resources identified for implementation</p>					
	<p><b>Objective 2.8:</b> Continue to harden essential and governmental facilities to maintain operations.</p> <p><b>Measure:</b> Additional resources for hardening.</p> <p><b>Measure:</b> New buildings incorporate hardening into design and building process.</p>					X
3) Continue to Enhance and Use 's geographic information system (GIS) for Disaster Risk Reduction (DRR)	<p><b>Objective 3.1:</b> Use the database and geographic information systems developed for the risk and vulnerability assessment to improve disaster decision-making and ensure consistency in planning activities county-wide.</p> <p><b>Measure:</b> Updated maps produced for this plan.</p> <p><b>Measure:</b> Updated maps incorporated into other plans, such as the General Plan update.</p>			X		X
	<p><b>Objective 3.2:</b> Continue to use the web-based county servers to access and share information among Kaua'i County agencies.</p> <p><b>Measure:</b> Data-sharing and improved, coordinated permits that incorporate mitigation.</p>					X
	<p><b>Objective 3.3:</b> 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.</p> <p><b>Measure:</b> Improved data for RVA</p> <p><b>Measure:</b> Added staffing and financial resources for the KC GIS program.</p>			X		
	<p><b>Objective 3.4:</b> Use GIS to improve building codes and permitting for disaster risk reduction-related activities.</p> <p><b>Measure:</b> Building Division ensures added data from wind-risk studies and building code updates are incorporated into KC GIS system.</p>			X		X
	<p><b>Objective 3.5:</b> Use GIS to improve land use permit system to reduce multi-hazard risks.</p> <p><b>Measure:</b> Number of permits requiring risk reduction measures for issuance</p>			X		X
	<p><b>Objective 3.6:</b> Ensure County and State GIS is shared and updated.</p> <p><b>Measure:</b> Participation in the Hawai'i Geographic Information Coordination Council.</p>					X
4) Improve communications systems	<p><b>Objective 4.1:</b> Ensure remote areas remain reachable during a disaster event (i.e. warning sirens and information systems are working).</p> <p><b>Measure:</b> Number of drills and system tests</p> <p><b>Measure:</b> Implementing solutions learned from tests and drills.</p>				X	
	<p><b>Objective 4.2:</b> 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.</p>			X		

	<p><b>Measure:</b> Number of improvement implemented in system.</p> <p><b>Measure:</b> Implementation of tests and drills to ensure maintenance and address gaps</p>					
	<p><b>Objective 4.3:</b> Continue to use local communications networks (formal and informal), information-sharing and integration of new technologies and social media to improve dissemination of warning, response and preparedness information.</p> <p><b>Measure:</b> Implement tests for systems to ensure operability; address gaps iteratively</p>	X			X	X
	<p><b>Objective 4.4:</b> Involve community organizations in communications network to ensure that local citizens remain informed and aware of disasters and response.</p> <p><b>Measure:</b> Implementation of communications strategies in Community Resilience Plans</p>		X	X		
5) Ensure that adequate shelter is available to all residents and visitors.	<p><b>Objective 5.1:</b> Harden and retrofit identified shelter facilities to improve ratings of facilities (see assets section in chapter four).</p> <p><b>Measure:</b> Number of increased shelter spaces in every community.</p>				X	
	<p><b>Objective 5.2:</b> Ensure the development of shelters for special needs populations and pet-friendly facilities.</p> <p><b>Measure:</b> Number of increased shelter spaces for different special needs in every community</p>				X	
	<p><b>Objective 5.3:</b> Encourage residents and hotels to harden, retrofit and build safe rooms to take responsibility for sheltering, including visitors and employees</p> <p><b>Measure:</b> Number of increased safe rooms.</p>	X		X	X	X
	<p><b>Objective 5.4:</b> Provide sheltering to meet population needs from the impact of a catastrophic event and need for mass sheltering.</p> <p><b>Measure:</b> Identification of shelters for mass sheltering and strategy for provisions (electricity, food, etc.)</p>				X	X
6) Engage in disaster public awareness activities	<p><b>Objective 6.1:</b> Use risk and vulnerability assessment and maps to improve the quality of public awareness materials distributed via the County website, libraries, public outreach events and social media.</p> <p><b>Measure:</b> Disaster public awareness materials distributed in the County</p> <p><b>Measure:</b> Participation and distribution at community fairs and events</p> <p><b>Measure:</b> Number of discussions about Hazards, Risk, and Resilience on radio or news</p> <p><b>Measure:</b> Development of Community Resilience Plans</p>			X		X

## 1.2 Meeting Local Mitigation Plan Requirements in 2015

The County of Kaua'i Multi-Hazard Mitigation and Resilience Plan, 2015 Update must ensure that it meets the requirements specified by FEMA for approval. The planning process was

designed with reference to these requirements. This section discusses how these requirements have been achieved in this Plan.

### **1.2.1 Documentation of the Planning Process**

**A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))**

The jurisdiction is the County of Kaua'i bordered by the ocean on all sides, with no neighboring border. This includes the islands of Kaua'i, Ni'ihau, Lehua and Ka'ula. The first disaster resilient community executive order was established September 09, 2003, and was continued by the current Mayor, with the support of the leaders in Kaua'i County.

The 2015 Plan Update process began in 2013 as the Managing Director of KCDA included the update of the plan in the annual budget. Approvals were finally conducted in early 2014, and the University of Hawai'i Social Science Research Institute was contracted to prepare the update. Because UH is a "state instrumentality," the procurement process is simplified for state and counties agencies, and can be developed more quickly, which has resulted in UH SSRI being the lead preparer and coordinator of the three plans for Kaua'i County. The Director of the Hazards, Climate, & Environment Program, Dr. Cheryl Anderson, is the primary author of the plan. The Plan describes Federal, State and local participation in the Plan development. Participants from both private and government sectors are represented.

The Executive Order continues to support the Kaua'i County Disaster Management Committee (DMC), comprised of the current executive committee members and directors of the county agencies. Since the county developed the first Plan in 2004, there have been changes to the committee reflecting changes and new knowledge in the county. The DMC recognizes that the isolation of Kaua'i during a disaster means that there should be consideration of sustaining communities and supporting community capacities for disaster resilience. The focus has expanded to considerations of resiliency, as communities such as the North Shore from Hā'ena to Hanalei have developed community disaster resilience plan (See Chapter 6 Appendix E).

With the experiences of one declared disaster (flood), several disaster threats (impending hurricanes and evacuations), and a hazard interruption (rockfall on roadway that impeded transportation) in the last five years, Kaua'i County continues to learn from the impacts as well as the process of evacuation. During the evaluation of the previous Plan implementation, conducted by the contractors for the development of the Plan, the lessons were captured and reflected in recommended hazard mitigation actions for this 2015 Plan update. These lessons demonstrated the isolation of communities, and how they can be cut off from resources and access by closing roadways, and the need to ensure that communities focus on resilience.

Chapter Two of this document describes the planning process used, including methods for the risk and vulnerability assessment, lists of meetings, and a description of the public awareness campaign. The first hazard mitigation planning activities began with support from the Project Impact initiative in 2003. The two years of funding for Project Impact were foundational for the development of mitigation in the County, enabling Kaua'i Civil Defense to establish partnerships, organize an advisory committee that became the County Disaster Management Committee (DMC), and increase public awareness about hazard mitigation through a variety of

forums, including television, media and fairs. The current plan update process began officially in September 2014, although the Managing Director had previously briefed the Mayor and County Council as she developed the budget to include funding for the hazard mitigation plan update process in 2013. The 2015 Plan Update process benefit from widespread awareness in the community and from ongoing outreach and meeting participation.

During the risk and vulnerability assessment, the planning team invited participation from the four planning districts at public meetings to identify hazard mitigation needs and verify information in the maps. During the Plan update processes in 2009-2010 and 2014-2015, members of the communities were contacted to respond to questions describing changes in these districts. Disasters occurring since the first Plan provided opportunities for engaging communities in public meetings to update actions required to improve risk reduction, including raising awareness about hazard zones and preparedness measures, the development of updated evacuation routes and awareness of actions to take in disasters for the resident and visitor populations. Recent large-scale research and planning to improve the general tsunami evacuation zones and routes involved extensive public awareness campaigns with the communities in 2013 and 2014, which will be followed later in 2015 with the roll-out awareness campaign of the **Great Aleutian Tsunami** and New Extreme **Tsunami** Evacuation Zones (ETEZ).

The Plan has been used by many of the county departments as a cornerstone of other planned development. In addition to working with county agencies, Kaua'i Civil Defense has continually engaged the private sector and general public through planning and outreach activities. The Plan provided critical information for the private sector regarding permitting and development planning. The NOAA Pacific Services Center used the initial Plan in 2003 to build a web-based software tool in 2004 and 2005 that enabled county planners and the permitting departments to reference hazard information. These tools have continued to be updated and refined, and the County currently operates well-integrated GIS-based planning tools. NOAA Pacific Services Center aided in the development of the Kaua'i Online Hazard Assessment (KOHA) tool updated and released in early 2009 and then updated with the digital FIRMs approved in November 2010, and most recently with the updates of the 2013 tsunami evacuation zones certification (<http://coast.noaa.gov/koha/?redirect=301ocm#>). In addition, all of the County plans were used as the foundation for the State of Hawai'i Multi-Hazard Mitigation Plan in 2004, and there are two voting members from Kaua'i participating in the Hawai'i State Hazard Mitigation Forum and one on the Ocean Resource Management Plan Disaster and Climate Change Working Group to ensure that local interests and needs are included in the State's mitigation efforts.

The planning process was designed to ensure that local community efforts are included in the Plan, and that the needs build to the county level, and then the state level. There is connectivity and integration of the planning efforts at every level.

**A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))**

The planning process has been designed to recognize efforts at resiliency planning at the community level, to ensure that there has been consistent public awareness efforts and

community involvement in updated hazards research and information, such as evacuation studies, and to make sure that there is connectivity at every level in planning processes that relate to building resilience and reducing disaster risks at every level, including public and private sector involvement.

Since 2003, the disaster planning process has consistently referenced the Kaua'i County General Plan, which is the plan and process that regulates development in Kaua'i. In addition, the Kaua'i County Planning Department has been consulted in the development of this plan. The current update of the General Plan is occurring at the same time as this plan development, and references the ongoing efforts. Communities have also developed plans that feed into the General Plan process and these plans are also referenced as they become available. These are discussed in Chapter Six on mitigation planning efforts, as these plans are designed to improve transportation, economic livelihoods, and quality of life for residents and visitor communities, and these efforts help to build resilient communities.

**A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))**

The public has been involved through community meetings and through the risk reduction initiatives that have occurred during the past five years. The planning team has interviewed members of the public in addition to conducting a series of meetings where invitations were distributed by the Mayor's office and then the radio stations interviewed Mark Marshall, Kaua'i Civil Defense Emergency Officer, who invited the communities to participate and announced the meetings, in addition to discussing the importance of hazard mitigation efforts.

The draft of the Plan was released for public comment and discussed with members of Kaua'i County attending the Contractor's Association of Kaua'i (CAK) Annual Home Show. A booth was set up to show residents their hazard risk for multiple hazards, to discuss the mitigation recommendations proposed by communities and government agencies thus far, and to take additional comments for improving and updating the final version of the Plan for submission. Participants who submitted their names and information on mailing lists have been contacted and provided information about the Plan.

**A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))**

Kaua'i County participates fully in statewide efforts for disaster risk reduction and ensures public awareness of risks and solutions to address those risks. The review and incorporation of disaster plans as well as development plans has been well considered and these plans, studies, reports, and technical information have been incorporated into the planning process for more than 15 years (Chapter 6 Table 6-1 identifies planning efforts contributing to mitigation and resilience). The Mayor's Vision and Holoholo 2020 action plan are used for aligning Goals and Objectives for this 2015 Plan Update.

Kaua'i County currently utilizes comprehensive land use planning and zoning, capital improvements planning, and building codes and standards to guide and control development in the County. The 2015 Update Plan references the General Plan Update (currently underway), and community plans. The General Plan Update commissioned technical studies on sea level rise, which are integrated throughout this update as risk maps. The General Plan Update will

recommend hazard mitigation considerations in the outcomes. These are discussed in Chapter Six.

Since the Mayor has officially adopted the Multi-Hazard Mitigation and Resilience Plan, the existing planning mechanisms will integrate hazard mitigation strategies. The permit process integrates the risk and vulnerability assessment and maps in the geographic information system (GIS) to improve decision making for allowing future development. The Kaua'i County General Plan already establishes land use policies that will mitigate the impacts of natural and human-induced hazards.

As described in Chapter Six, the Building Division in the Department of Public Works used updated wind risk analyses to review and adopt the International Building Code. There are new studies underway that will improve the IBC from the 2006 adopted code to the 2012 code once completed.

There has been constant and consistent effort to reference the latest information, technology, studies, rules, and regulations that exists beyond the Multi-Hazard Mitigation and Resilience Plan, 2015 Update process, and to ensure compliance to new rules and participation in activities and processes that will reduce the risks of disaster impacts and ensure safety of the people in Kaua'i.

**A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))**

Since the adoption of the first Plan, the County of Kaua'i has continued to involve the public in planning and mitigation activities through outreach and community events. Kaua'i County Civil Defense Agency will distribute the copies of the Plan to relevant agencies and organizations in the county. They will also collect comments and suggestions for review and consideration by the Disaster Management Committee, and extend solicitation for future projects on an annual basis.

In addition, copies of the Plan and any proposed changes will be posted on the Kaua'i County website:

<http://www.Kauai.gov/Government/Departments/CivilDefenseAgency/tabid/90/Default.aspx>.

This site contains an email address and phone number to which people can direct their comments or concerns directly to KCDA.

The Disaster Management Committee (DMC) holds public meetings to gather input from the larger community to ensure that the Plan continues to implement mechanisms to reduce hazards throughout the county.

The efforts of the Hanalei to Hā`ena communities to produce a community disaster resilience plan, have resonated with other communities in Kaua`i, and while the local development plans have recently been updated in preparation for the General Plan Update, there is interest in focusing these plans on long-term resiliency. This Plan proposes the development and use of these resiliency plans, and there will be efforts to find resources for implementation of these planning efforts in other communities. This will ensure that there will be consistent involvement of the communities of Kaua'i in the mitigation efforts over the coming five years.

**A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))**

Chapter Eight describes the Plan maintenance process, including the schedule for monitoring, evaluating, and updating the mitigation plan. The first big review will occur with the planned update for the State of Hawai'i Multi-Hazard Mitigation Plan (2016) to assess the success of the identified mitigation strategy and process. The mitigation actions will be reviewed and updated annually. Furthermore, the goals and objectives will be reviewed by the DMC to identify achievements and to ensure that the Plan meets its targets.

**1.2.2 Hazard Identification and Risk Assessment**

**B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))**

Chapter Three identifies natural hazards that can affect Kaua'i County. Chapter Three provides a description of hazards as they affect Kaua'i County. Not all hazards have the same impacts in every county. For example, Kaua'i County has less risk from volcanoes and earthquakes, although the past several years has included an increase in the amount of vog, or volcanic gas, that degrades air quality and increases respiratory illness, even in Kaua'i, however, since the days that produce these effects are not quantifiable and don't meet the threshold of a hazard, the hazard has been sidelined in this plan and should the effects become of greater significance resulting in severe hazard in the upcoming five years, Kaua'i is prepared to include information in the next plan. The hazards included in this Plan include: hurricanes and strong winds, flooding (including stream floods and coastal storm inundation), drought, wildland fire, *climate variability and change*, earthquake, tsunami, erosion, landslides, *dam breaches*, *hazardous materials*, *homeland security and terrorism*, and *health-related hazards*, such as pandemic flu and dengue fever outbreaks [Note: italicized hazards have been included beginning in 2009 in alignment with the State plan and reflecting priorities of the county, specifically the climate change and dam breaches; volcanic hazards and vog were removed in 2015].

Kaua'i County has experienced one disaster declaration in the past five years. The flood information continues to be updated, and is described more thoroughly in appendices discussing the National Flood Insurance Program (NFIP). The levees have been repaired and meet compliance with federal requirements and the county has worked to ensure that actions were taken for repetitive loss properties (RLP). The County has reduced its severe repetitive loss properties (SRLP) to none, beginning in 2010, and activities on reduction of RLP have one remaining property to deal with before requesting the next Community Assistance Visit (CAV), and future participation in the Community Rating System (CRS) expected in 2017.

New data has been developed on tsunami hazard, with improved inundation studies from the University of Hawai'i that enabled the review and revision of the evacuation routes and maps for Kaua'i, which have been released in 2014. This coincides with awareness-raising efforts on the impacts of tsunami (and all hazard risks). Signage has been added around the island that marks evacuation routes.

Landslides and rockfalls continue to impact the highways, which are part of the State Highway system. Falls in 2014 stranded people from their homes and/or work for several days and provided economic impacts. While roadway mitigation schemes are being implemented, the

falls cannot be prevented fully, and the public has become aware of the risks. Due to the mountainous geography, there is one main roadway around the island connected by bridges, and only a few areas in Wailua and Kapa'a for roadway bypass and alternate routes. One approval for mitigation action on the North Shore will close the last section of the road and provide new areas for parking or shuttle services to prevent visitor populations to the State Park from threats of rockfalls and landslides (that have historically been dangerous for people as well as damaging vehicles), and this will have an additional benefit for conservation and environmental restoration efforts that promote resiliency.

Even though there were not more declared hazards, there were two severe threats from hurricanes in 2014 that resulted in the opening of evacuation shelters. The County learned lessons about sheltering and evacuating the visitor population near the airport, because there are limited resources on the island for the resident population, let alone the visitor population. There are increased efforts to ensure that the visitor population has information about the types of resources needed if staying in remote areas that can be cut off, such as the North Shore. Further efforts are concentrating on ways to evacuate visitors early or shelter near the airport to reduce the burden on local residents for visitors who may not have provisions for disasters or sheltering.

**B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))**

Chapter Three contains historical occurrences of the natural hazards. Chapter Three Appendices have updated maps for the communities of Kaua'i for erosion, tsunami, storms, landslides, and aggregation of different hazards. Updated data includes projections for sea level rise (SLR). The appendices include the completed studies of the dams for the County of Kaua'i that fall under state jurisdiction and have been included in recent inspections for dam safety, to prevent incidents, such as the dam failure at Koloko in March 2006. Additional map appendices show tsunami and flood zones and drought and wildfire areas. The wind risk maps provide contours for wind speeds that are modeled from Hurricane Iniki speeds, and these maps have been used to update the building code in 2012 to the state recommended risk standards under the adoption of the 2006 International Building Code (currently the Statewide IBC standard).

**B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))**

In Chapter Four, the Assets have been identified for Kaua'i County. Assets have been categorized in the following areas: Emergency Services Infrastructure; Economic Assets; Critical Energy Infrastructure; Critical Telecommunications Infrastructure; Critical Transportation Infrastructure; Critical Water Infrastructure; Social, Cultural, and Environmental Assets; Government Facilities; and, Vulnerable Populations. Chapter Five integrates information on hazard risks with the important assets to understand risk and vulnerability of hazards and impacts on Kaua'i County. The tables and maps for each community in Chapter Five show the areas of critical facilities referenced by hazard risk.

Table 5-15 located at the end of Chapter Five provides values for structures and property identified as critical facilities and infrastructure for different sectors. The values were obtained from the tax database for the county. Other methods to determine loss estimates, such as average annualized loss are described in the last section of Chapter Five, although loss values, if known or estimated (based on the best available data) have been included at the end of each hazard discussion. The estimated property loss values in Kauaʻi total more than \$1.5 billion should there be a catastrophic event.

From the study of state facilities modeled with HAZUS, the riskiest buildings include:

**Table 1-2. HAZUS Kauaʻi Hurricane Probabilistic Scenario**

Building Name	Estimated \$ Loss	Est. % Loss	\$ Loss Rank	% Loss Rank
Lihue Airport	\$6,286,140	21.0%	21	165
Kauaʻi Veterans' Memorial Hospital - Original	\$2,279,633	14.7%	57	217
Port Allen Pier Shed - Warehouse	\$1,502,135	34.3%	79	33
Lihue Public Library	\$934,539	21.0%	114	165
Lihue Courthouse	\$923,644	21.0%	118	165
Kauaʻi Veterans' Memorial Hospital - Obstetrics	\$231,513	14.7%	226	217

Source: Best Available data as of 2015: Martin & Chock, 2010, "Structural Risk and Vulnerability Assessment" in State of Hawaiʻi Multi-Hazard Mitigation Plan, 2010 Update.

The Risk Rankings for the State were developed from examining 274 State Facilities valued over \$250K that are at risk from Hurricanes. Only six facilities from 274 statewide are located in Kauaʻi. Rankings indicate that these are not the highest priority facilities. However, the Lihue Airport has the highest elevation of all the airports in the State, which may be important for disaster recovery should Oʻahu be hit catastrophically.

The first section of Chapter Four provides an overview of land use and development. Section Three of Chapter Five describes assets within the County that require protection or have been identified as essential or critical facilities and infrastructure. The mitigation Plan references the Kauaʻi County General Plan that determines land use policies for the county. Mitigation options have been developed in reference to these policies. Chapter Six identifies actions and activities that have been used to reduce risks and the capability of the county to continue to mitigate impacts of hazards. Kauaʻi County has flood ordinances, coastal management, and practices to reduce erosion. Most recently, there have been programs to address dam safety, planning for evacuations from hurricane and tsunami, and ongoing public awareness and outreach activities to ensure that Kauaʻi residents and visitors are well-informed of their hazard risks.

In addition, resiliency plans take into account the livelihood activities and safety of the communities at risk from multiple hazards. These plans identify alternative mechanisms for coping with threats. One important aspect identified is that the communities do not have the resources to cope with the 10,000 visitors per day that could be potentially stranded in places such as the North Shore. The community has proposed recommendations for thresholds and warning that ensure these visitors evacuate early. Plans have considered the need to assist schools and neighbors at higher risk from illness, age-related challenges, or other special needs.

**B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))**

In Chapter Three, the flood hazards have been identified. In Chapter Five, the National Flood Insurance Program's requirement for repetitive flood loss identification is provided. In Chapter Six, current flood mitigation tools to address flood risks are identified. Chapter Seven makes specific recommendations to address flood hazards and Chapter 7 Appendix B includes a summary of the Kaua'i County NFIP. The Kaua'i County Flood Coordinator has conducted community meetings and outreach to ensure that residents in the County are aware of their flood risks and that they know how to address these risks.

Kaua'i County Department of Public Works has worked with the FEMA NFIP coordinators to improve the issues with permitting violations, especially in regards to repetitive loss properties. In light of recent work, it seems likely that the County will be able to proceed with the Community Assistance Visit (CAV) and to pursue participation in the Community Rating System (CRS).

### **1.2.3 Mitigation Strategy**

**C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))**

The Kaua'i County Mayor oversees the county departments and agencies, including: the **Office of the Mayor, Office of the County Attorney, Civil Defense Agency, Department of Personnel Services, Office of Economic Development, Agency on Elderly Affairs, Department of Finance** (includes Information Technology and GIS), **Kaua'i Fire Department, Kaua'i County Housing Agency**, Department of Liquor Control, **Department of Parks and Recreation, the Planning Department, the Kaua'i Police Department**, the Office of the Prosecuting Attorney, **Department of Public Works** (includes Building, Engineering, Wastewater, Solid Waste, Flood Coordination, and Capital Improvement projects), the **Transportation Agency, the Department of Water**, the Office of the County Clerk and the Office of the County Auditor [Note: highlighted departments have key risk reduction and management roles – disaster response, preparedness, mitigation, and recovery]. These agencies retain primary responsibility and authority to carry out policies and programs, and the highlighted agencies have critical roles in risk reduction. The annual budget shows that roughly \$45 million are expended on public safety, but this does not include some of the key salaries and roles of public servants and does not include civil society resources and contributions to overall disaster risk reduction and community resilience.

The Kaua'i County Council has seven representatives from local communities. The Council ensures that budgets and regulations are reviewed and established. There are seven standing committees: 1) Public Works/Parks and Recreation; 2) Committee on Public Safety; 3) Committee on Housing and Transportation; 4) Committee on Planning; 5) Economic Development and Intergovernmental Relations; 6) Budget & Finance; and 7) Committee of the Whole.

County Commissions and Boards include: Arborist Committee, **Board of Ethics**, Board of Review, **Board of Water Supply**, Board of Appeals, Charter Review Commission, Civil Service

Commission, **Commission on the Status of Women, Cost Control Commission, Fire Commission, Historic Preservation Commission, Liquor Control Commission, Mayor’s Advisory Committee for Equal Access, Public Access, Open Space, and Natural Resources Preservation Fund, Planning Commission, Police Commission,** and Salary Commission [Note: bolded boards and commission have key roles in ensuring resiliency and reducing socioeconomic and physical risks to hazards].

The previous and current Mayors enacted an Executive Order to establish Kaua’i County as a Disaster Resilient community and adopt the hazard mitigation plans (including this 2015 Plan Update), and there are activities outlined in the EO that identify ways to reduce risk, often with funding and agency mandates. The list of mitigation activities in Chapter 7 specifies the activities that are done as part of everyday responsibilities and agency mandates, and the activities that would require partnerships, collaboration, and external funding to support implementation.

The General Plan establishes the development direction for the county and identifies the land-use zones. The majority of Kaua’i County is designated as conservation lands (56%), 39% for agriculture, 1% rural, and only 4% of lands designated urban, from which commercial and residential property taxes provide county revenue. With roughly the same amount of acreage, the City & County of Honolulu has more than one quarter of lands in urban designation. While the General Plan process works with communities and government to review the land use and development projections, the changes in land use must undergo extensive reviews to change the designation, which limits development activities.

**C2. Does the Plan address each jurisdiction’s participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))**

Kaua’i County has implemented flood ordinances to reduce hazard risks, and participates in the National Flood Insurance Program (NFIP). Kaua’i County has an active flood coordinator, who engages community and participates in activities to enable community members to reduce their flood risks. With the number of streams and high levels of rainfall in Kaua’i, there is active attention to complying with NFIP requirements for citizens.

The County of Kaua’i is currently in good standing with the National Flood Insurance Program (NFIP) but has outstanding compliance issues relating to a 2003 Community Assistance Visit (CAV), a 2007 CAV, and a 2009 North shore field visit. These issues must be resolved before the CAV can be closed and deal mainly with elevation and building design issues at north shore properties. The County of Kaua’i has submitted documentation to resolve the violations listed in the CAV and the North shore field visit on an ongoing basis since the 2003 CAV was initiated. DPW last responded to FEMA in a letter dated January 16, 2015 and listed four properties where the County of Kaua’i action is still required. DPW anticipates that by the end of 2015 only one property where County action is required will remain and that the CAV can be closed at that time.

The County of Kaua'i wishes to remain in good standing with the NFIP and would like to eventually enter into the NFIP's Community Rating System (CRS). Entry into the CRS would require that the current CAV be closed, that a new CAV be conducted, and that a Community Verification Visit be conducted. The earliest that the County could complete the required process to enter the CRS is late 2017.

**C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))**

Section 1.1 of this chapter describes the hazard mitigation goals and objectives identified by the Disaster Management Committee (DMC). Chapter Seven describes the Plan for implementation of these actions. The projects have not undergone extensive benefit-cost calculations, although the county has successfully received mitigation funding in the past for building retrofits in Kaua'i County. The DMC has reviewed the projects to ensure that the costs of resources and implementation will likely have higher benefit cost ratios. Many of the identified actions include support for policies and activities that could be implemented through existing programs and daily operations by the county.

**C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))**

Chapter Six identifies the ongoing and current range of mitigation actions and projects being used to reduce the effects of each hazard. Chapter Seven targets gaps recognized in sector areas and hazard types based on the risk and vulnerability assessment. The risk and vulnerability assessment considers critical facilities and lifelines in several key areas, including government, economic areas, emergency services, and telecommunications.

**C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))**

Chapter Five on the risk and vulnerability assessment identified costs of inaction and failing to engage in mitigation. The policies and programs that are incorporated into the governance in the county do not have an explicit cost reduction value; however, these are critical to instilling risk reduction measures. The final prioritization of projects will be based on review of availability of funding programs suited for the action and the benefit-cost ratio. Since the engineering analyses are currently beyond the scope of the planning update and timing is critical for approval of the updated Plan, the extensive analyses will be conducted once the proposed sources of funding have been identified. For FEMA's PDM and HMGP programs, Kaua'i has previously conducted full benefit-costs analyses for submitted projects and successfully received funding for project implementation.

**C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))**

Chapter Seven identifies mitigation actions, policies, and projects that have been in place to reduce hazards and references the goals and objectives for the proposed actions that both can be done with agency support currently available or would require additional resources for implementation. The County will be considering this Plan update and its relevance in the General Plan Update process. Kaua'i County implemented several actions, such as Rim-Lot setbacks to deal with increased wind speeds up and down slopes and had incentives for participating in saferooms for shelters, as well as identifying shelters in public buildings to meet the critical lack of shelters. The capital improvement plans and projects are considering ways to leverage resources for improving facilities and to partner for improving communication systems in the county.

The Disaster Management Committee (DMC) has prioritized projects based on the availability of resources (human, financial, technical) to engage in the project. While large-scale, catastrophic events are always considered, and Kaua'i has had experience with these hazards, the County is also considering chronic hazards, such as stream flooding and rockfalls, because of the impact on lives and livelihoods. Priorities are based on opportunities and resource availability, as well as the extent of the impact. In addition, specific projects proposed have been reviewed with the STAPLEE consideration (impacts to Social, Technical, Administrative, Political, Legal, Environmental and Economic considerations). General considerations of cost-benefit are applied, although it is difficult to apply the cost-benefit analysis to preservation of resources that support community sustainability and resilience, such as watershed and coral reef ecosystems. The cost-benefit analyses (CBA) will be conducted in compliance with proposals submitted to FEMA for hazard mitigation grant funding. These would primarily involve recommendations for retrofits to public facilities for sheltering, and Kaua'i County has previously been successful in implementing several of these projects funded by FEMA.

#### **1.2.4 Plan Review, Evaluation, and Implementation**

##### **D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))**

As previously mentioned, the majority (56%) of Kaua'i County is designated as conservation lands, as well as 39% for agriculture, 1% rural, and only 4% of lands designated urban, from which commercial and residential property taxes provide county revenue. Large developments must acquire changes in land use designation and this does not happen rapidly. Furthermore, the developments must adhere to the permitting process, wherein hazard impacts are reviewed as developments are reviewed. The County wants to ensure that building permits are followed because illegal use and building has resulted in problems with NFIP compliance, as mentioned in the previous section. Furthermore, the County follows a process for the General Plan that projects development for the next ten years in order for the County to plan for infrastructure improvements and utilities to meet population needs. Development must be approved by the County in this context. Experiences from hurricanes, floods, and threats of sea level rise and tsunamis, have weighed into consideration of development projections.

##### **D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))**

Chapter Six details ongoing hazard mitigation activities and efforts, including the description of the community resiliency plan developed for the North Shore that serves as an example of the way that these resiliency plans can be conducted, which further contribute to identifying mitigation actions and risk reduction activities.

**D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))**

As described in Section 1.2 on Goals and Objectives, the Plan has been revised with the improved understanding of the importance of emphasizing long-term resiliency for communities and local governments. Rather than just thinking about the 5-year mitigation needs and actions, the County recognizes that it needs to support ongoing community activities that are developing resistance to the impacts of hazards. In addition, the proposed short-term activities adhere to the Mayor's outlined vision and projects that support community needs and aid in strengthening communities.

### **1.2.5 Plan Adoption**

**E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))**

To meet the requirements of DMA 2000 to conduct updates to their approved plan every five years, Kaua'i County has formally approved the Plan, as indicated in the Executive Order at the beginning of this document. The Disaster Management Committee (DMC) contributed significantly to updating information in all sections of the Plan. The Mayor of Kaua'i has adopted the County of Kaua'i Multi-Hazard Mitigation and Resilience Plan.

The Mayor of Kaua'i County, Bernard P. Carvalho, Jr., has signed an executive order to establish Kaua'i County as a Disaster Resilient Community. This executive order sets up a comprehensive mitigation program to address natural hazards. The executive order not only adopts the current mitigation Plan, but also supports the Plan through actions to maintain and update it, improve building codes, incorporate hazard analyses into land use decisions, and encourage partnerships with the private sector and local communities. It further establishes the executive branch of the government as the County Hazard Mitigation Committee to oversee implementation of hazard mitigation actions.

Since the adoption of the first Plan in 2003, Kaua'i County has demonstrated their commitment to building disaster resilient communities. Several of the best practices and key mitigation actions are detailed in the Chapter 6 Appendix. Not only has Kaua'i County adopted the mitigation plans formally, but they have strived to demonstrate the importance of mitigation through their actions. As the Kaua'i County General Plan Update is underway (2015), the County is looking at ways to build resilience as it considers development and infrastructure development. The Planning Department commissioned a technical study on sea level rise scenarios for consideration as the General Plan and community development plans are developed. Communities have developed disaster resilience plans to address risks and harness local capacity for risk reduction.

**E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))**

The Plan is not multi-jurisdictional, although the County of Kauaʻi participates in State of Hawaiʻi mitigation programs in addition to local mitigation actions.

### **1.3 Evaluation of the 2009 Plan Implementation and Gaps Addressed in 2015**

During the first update process for Kauaʻi County’s Multi-Hazard Mitigation Plan in 2009-2010, FEMA asked the project team to evaluate the effectiveness of the first Plan. In addition, the team identified changes in the activities of the county, lessons from disasters, and impacts of the completed hazard mitigation activities. During the first five-year Plan, there were several significant disasters that changed the focus of activities in Kauaʻi. In this review, there were fewer disasters, but as stated previously, the lessons have shifted emphasis to disaster resilience with consideration of the longer-term impacts of disasters, including threats from climate change and sea level rise. The isolation of communities during disasters has also emphasized the need to build community resilience.

Table 1-3. Evaluation of Previous Hazard Mitigation Plans and Changes in 2015

<i>Does the updated plan document how the planning team reviewed and analyzed each element in each section of the plan and whether any were revised as part of the update process?</i>	
Plan Requirement	Description
<b>ADOPTING THE PLAN</b>	
<b>Adoption of the Plan</b>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plan</b>                      The 2003 Plan worked with the Kaua'i County Mayor's office from the beginning of the preparation of the planning process, so that plan adoption became part of the mitigation planning process.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>                      The strategy to keep the Mayor's office involved in the development of the mitigation planning process continued. The Mayor approved of the Disaster Management Committee (DMC) and ensured participation of all county agencies in the planning process. The Plan adopted goals and objectives in line with the Mayor's vision (outlined in Chapter 1 and referenced with actions in Chapter 7).</p>
	<p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>                      The planning team (UH: Anderson, Fujii , DR: Henly-Shepard; KCD: Marshall, Ushio, Abeles - more discussion in process in next section) worked with the Mayor's Office to ensure that the DMC reviewed and recommended approval of the goals and objectives for this update and approval of the Plan to the Mayor.</p>
<b>PLANNING PROCESS</b>	
<p><b>Information on the process –</b></p> <p><b>Formation of the Disaster Management Committee and Involvement of committee members in the plan update (details also in Chapter 2 Table, p. 2-4 – 2-8).</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plan</b>                      In 2002, there were numerous meetings to build awareness among agencies and the disaster management committee was formed using the Project Impact guidance. Most of the members were new to the mitigation planning process in 2002, and contributed information on their agency activities when asked, but were not aware of the ways that their agencies could contribute to mitigation. After the plan was approved in 2003, the county agencies began to be more aware of hazard mitigation and ways that their agencies could contribute to improving their roles and contributions to mitigation. This continued through the development of the first plan update, approved in August 2010.</p> <p>The previous approved plans included extensive input from:</p> <ul style="list-style-type: none"> <li>• <b>Office of the Mayor</b></li> <li>• <b>Civil Defense</b></li> <li>• <b>Public Works</b>  <i>Wastewater Division, Solid Waste Division, Building Division, Engineering, Capital Improvements</i></li> <li>• <b>Water Department</b></li> <li>• <b>Fire Department</b></li> <li>• <b>Planning Department</b></li> <li>• <b>Finance</b></li> <li>• <i>Information Technology, Real Property</i></li> </ul> <p>In the 2009/2010 update process, the DMC has been working with the County Civil Defense agency for more than five years, and the increased awareness of agencies has improved the mitigation activities incorporated into agency</p>

operations and resulted in increased participation.

**Gap Addressed and Change incorporated into the 2015 Plan update**

The 2015 update process involved a series of interviews with all of the agencies involved in the previous Plan update and additional civil society and local community organizations.

- **Kaua'i Agency on Elderly Affairs** has a role in ensuring that there is proper awareness of hazards among a population that may be more vulnerable based on illness, mobility, and support, living on fixed incomes with little extra funding to upgrade or retrofit their housing. In this Plan update, the Elderly Affairs department participated and contributed ideas on improving public awareness among the elderly and special needs populations in Kaua'i. They have also contributed to disaster preparedness and supported recommendations for shelter improvements that will protect the elderly populations that they serve.
- **Office of Economic Development** works with the tourism association, hotel associations, and supports local tourism-based operations, and has encouraged planning with the county civil defense to make agreements for sheltering in place and for evacuation. Strategy recommendation to continue to build education and awareness among hotel and tourism operators and visitor population (see Chapter 7).
- **Kaua'i Visitors Bureau** has experience working with the tourism industry to find adequate shelter during hurricane evacuations. They identified resources to feed and shelter stranded visitors. They also see the value in ensuring that visitors know what to do and how to prepare for their stay, and that they can either work with the hotels to keep visitors safe and work with airlines to evacuate. They are trying to make sure that visitor accommodations have information on hazard risks for visitors.
- **Police Department** works primarily as a first responder (with responsibility from natural disasters, and homeland security threats), but also sees areas where hazard mitigation is needed. They have critical insights in improving the telecommunications and have further input in public outreach and awareness.
- **Housing Agency** has contributed to identification of vulnerability based on lack of low-income housing and homelessness, especially related to the depressed economy and loss of local jobs. The median home price for Kaua'i is higher than the other islands, and it is difficult to find rental properties for the working population. There is a lack of housing for the general workforce supporting the economy of Kaua'i. Recommendations for increasing housing assistance and securing shelters during disasters have been included in the Plan update (see Chapter 7).
- **Transportation Agency** has worked with the Kaua'i Civil Defense to improve transportation for bus evacuation from tourism areas and to lock down parking lots in tourism areas. Assisting in process for constructing a by-pass road in Wailua, where area is impacted by heavy traffic (although this is a State Department of Transportation highway project). Recommendations were included for continuing strategy to identify transportation issues that can aid in public safety and evacuation, especially for special needs

	<p>populations (see Chapter 7).</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The planning team (Anderson, Henly-Shepard, Fujii; KCD: Marshall, Ushio, Abeles) conducted initial group meetings for input into the Plan, followed by interviews of all agencies with questions for each group (Chapter 2 Appendix 2). In addition, copies of plans, proposals, and documentation of efforts for risk reduction were collected, in order to be referenced in relevant sections of the Plan. The interviews and plans that inform hazards identification are included in Chapter 3 on hazard identification; assets that needed to be protected were included in Chapter 4. Information that contributed to improved vulnerability assessments was included in Chapter 5 (such as updated GIS data for current RVA). Actions that were being taken that enhance current mitigation efforts were included in Chapter 6. Suggestions and recommendations for improvement in mitigation were included in Chapter 7. The goals and objectives, and hazard mitigation actions, have been reviewed and approved by the DMC, and then reviewed and approved by the Mayor.</p>
<p><b>Involvement of Non-Government Organizations, Civil Society, and General Public</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  During the development of the 2003 Plan, Kaua’i County was involved in Project Impact that established relationships with the private sector, non-governmental organizations, civil society, and community organizations to work with public agencies in looking at hazard mitigation and reducing risks. The electric and water utilities and the phone company participated, since they deal with critical lifelines. The Contractor’s Association of Kaua’i provided the primary coordination for the Plan, and the county’s developers, contractors, and large landowners participated in mitigation planning.</p> <p>Community meetings were held to reach the general public. Comments from participants were that the meetings were useful and informative, but there were too many community meetings in Kaua’i for related activities and planning, and even if there was interest, people were tired and did not have time to participate. Those that commented this way explained that there are quite a few active community associations in Kaua`i, and it would be better if Kaua’i Civil Defense participated in these meetings and provided information about hazard mitigation planning in these venues where people had already dedicated their own time to participate. Public comment about the Plan was open online and through consultation, but outside of the public meetings, no comments were received online.</p> <p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  Following the approval of the 2003 Plan, Kaua’i Civil Defense began to follow recommendations to continue public awareness efforts and to use established organizations and their regular meetings to discuss mitigation. This was used to maintain relationships with key organizations and communities so that disaster management did not require new public processes. This has continued, but there is more involvement during problem-focused planning, such as the development of the tsunami evacuation maps updated in 2015.</p> <p>The private sector, especially the Contractors Association of Kaua’i (CAK) continued to think about hazard mitigation. The monthly newsletter has</p>

	<p>provided articles, information, and documentation of mitigation efforts and the need to remain vigilant in preparation for hazards. At the annual home shows, CAK provides space for public agencies to discuss preparedness and hazard mitigation with the general public. CAK has further coordinated seminars to ensure that hazard mitigation information is reaching its members and the general public. CAK continues to provide a key role in public education and outreach that complements the outreach and mitigation planning efforts of Kaua'i County.</p> <p>Community organizations provide important coordination for local planning efforts throughout Kaua'i County, and their activities improve the resilience of local communities by addressing issues and building capacity to cope with impacts from development. Several communities have organized around their ahupua'a, or watersheds, such as the Hanalei Watershed Hui. They have engaged in hazard mitigation activities through local environmental planning efforts that focus on reducing risks from flood hazards or in ensuring sustainability of communities. The Po'ipu Beach Resort Association works with the hotel and rental developments in an area that was devastated during Hurricane Iniki in 1992, and based on this experience, continues to work with the community and KCD to conduct preparedness and hazard mitigation. While there are numerous examples in Kaua'i, these two organizations were highlighted due to planning efforts that contribute to building community resilience to impacts from hazards. The Mayor's initiative on culture further supports ahupua'a activities.</p> <p>To reconcile various community and environmental plans for the North Shore, the Hanalei to Hā'ena Community Disaster Resilience Plan was developed from 2010-2014 in collaboration with County agencies including the KCDA. This Plan is in the process of implementation and provides a model for other communities to develop local resilience plans that address local needs. The Plan considers both immediate and longer-term needs.</p> <p>The 2015 plan was reviewed with the public in person at the annual Contractors Association of Kaua'i Home Show that pulls in public to consider different building and home needs. The Plan has been available online at the County website, and the public can comment and provide input. The county recognizes that mitigation planning is a process, and that Kaua'i Civil Defense will continue to seek public input to improve hazard mitigation, and to contribute to the annual review of projects and activities by the DMC.</p> <p>Based on the continued efforts in hazard mitigation since the first Plan approval, the organizations that support critical infrastructure have been continuously involved with Kaua'i Civil Defense in planning. The Kaua'i County Utility Preparedness and Response Group were formed and includes improved input from telecommunications. These organizations participated in the mitigation planning effort to suggest mitigation for poles, lines, and cables that would be threatened during storms, as well as strategies to remove debris but salvage felled lines to minimize costs of replacement following storms. The water and power utilities continued to participate in mitigation planning efforts as they did</p>
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	<p>in the first planning effort.</p> <p>The Humane Society has expended their capacity and engaged in mitigation planning to provide sheltering for pets during disaster. HS can currently handle 500 cages for dogs. In addition, HS provides public awareness to ensure that residents think about food, water, and medicine for their pets in a disaster. In 2005, the Contractors Association of Kaua'i (CAK) hardened doors with a grant from the National Association of Homebuilders.</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The expansion of the Plan to consider resilience emerged throughout the 2009-2010 planning process, where the Plan provided best practices from community groups that contribute to strengthening the community, which in turn makes the communities more resilient to the impacts of disasters. NOAA provided resources through a Community Resilience grant that involved the North Shore (Hanalei to Hā`ena). Since there were numerous resource and environmental studies and hazard mapping conducted, it was possible to merge the studies with information on community needs in disaster to develop the Hanalei to Hā`ena Community Resilience Plan, which was completed prior to the contracting process for this current 2015 Update. The Plan had been presented previously to the Mayor, and the executive order specifically addressed Disaster Resilience, and therefore, the County agreed that the focus on resilience needed to be incorporated into the Plan update process. The DMC approved the revision of goals and objectives in line with resiliency, and the Mayor has approved this.</p> <p>The Plan has been made available for public comment through the website, but based on previous experience, input and comments were primarily successfully gleaned through consultation, interviews, presentations, and workshops.</p> <p>Kaua'i Civil Defense built and maintains relationships with county agencies, private organizations, non-governmental organizations, civil society, and utility companies, so the established relationships facilitated input and consultation for the mitigation Plan update. Ultimately, the decisions for process and inclusion of information are approved by the Disaster Management Committee (DMC) and the Mayor's office.</p>
<b>RISK ASSESSMENT</b>	
<i>Identifying Hazards</i>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  UH SSRI has conducted evaluations for the development of the plan updates. During the development of the 2003 Plan, Project Impact had just begun, and from 2001-2003 supported the State's public education and outreach program. Kaua'i Civil Defense was additionally supportive, and participated in the State of Hawaii Hazard Mitigation Forum. As part of the initial outreach efforts, Forum members were polled and voted on the hazards that should be considered as a primary part of their efforts. Since Kaua'i participated in the Forum and supported the direction of the outreach campaign, it was decided by Kaua'i Civil Defense and Project Impact that the first hazard mitigation strategy should focus on the same hazards. Although Kaua'i no longer has active volcanoes, they do experience vog when winds shift, but it was determined that there is not enough data to support this being considered a hazard, and therefore, in the 2015 Plan</p>

	<p>Update, vog has been removed from consideration until data and significance of the risk increase. Otherwise, the County of Kauaʻi has experience with all hazards listed, including hurricanes, flooding, drought, wildfire, erosion, landslides, earthquake, and tsunami. In the 2009 plan, to remain consistent with the State plan and to reflect increased concern expressed in surveys and public meetings, climate variability and change and dam breaches were added as a hazard. In addition, homeland security, hazardous materials threats, and health-related hazards were added.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  The 2006 flood and dam failure in Kauaʻi elevated the concern about dam safety throughout the State. Inspections were conducted of dams and levees in the State of Hawaii, and information was included in the State Multi-Hazard Mitigation Plan update, then a schedule was devised for continued review and inspection, with the development of vulnerability mapping (not available until later 2010). Since the disaster happened in Kauaʻi, and efforts were made to prevent additional dam and levee failures, this was included as a hazard.</p> <p>Sea level rise has been identified as a future problem combined with current rates of erosion. As a result of climate variability and change, there are extreme variations in sea levels and threats of longer-term rise. In addition, climate variability and change may exacerbate climate-related extreme events. More studies have been conducted internationally, in the Pacific, and in Hawaii State since 2003, and these have been included. The Pacific Islands Regional Climate Assessment was finalized in 2013 with public meetings on all Hawaiian Islands to discuss risks and impacts. This has elevated concern of the public, and resulted in a response by the County to conduct a technical study of sea level rise projections in tandem with the development of the Kauaʻi County General Plan Update (2015).</p> <p>Additional hazards considered include those from public health, hazardous materials and oil spills, and homeland security threats, all of which could contribute to cumulative and secondary threats in combination with the natural hazards described in the document.</p>
	<p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  Identification of natural hazards occurred primarily from experience dealing with hazards and understanding of the need to prevent these disasters from occurring. The planning team with Kauaʻi CD made recommendations on inclusion of hazards, which had once been consistent with the State plan, but may need revision and coherence in the upcoming five years. These were reviewed and approved by the DMC and recommended for inclusion in the Plan. The Mayor’s office provided final approval in the Plan adoption.</p>
<p><b>Profiling Hazards</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  Hazards that were profiled included those in the previous list of hazards. The GIS system was developed with hazard layers. In 2003, the best available hazard layers were the FIRM maps and the tsunami evacuation zones. At the time, the high wind and other hazards did not have any layers to use in mapping, although the damages from Hurricane Iniki and the rebuilding provided information about the risks from strong winds.</p>

	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  Studies since 2003 provided additional hazard information layers, including a coastal erosion study completed in 2009 (see Chapter 3 appendix 2), dam safety investigations and assessments (see Chapter 3 appendix 4), and results of wind risks studies conducted for a building code assessment. The occurrences of hazards, especially flood hazards, were updated. The tsunami inundation study and evacuation map updates in 2014 provide significant changes for the information in the Plan. In addition, UH Sea Grant and UH Coastal Geology Group have improved erosion studies and used these to recommend shoreline setbacks and projections of sea level rise.</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The planning team with Kaua'i CD researched and updated hazards. These were reviewed and approved by the DMC and recommended for inclusion in the Plan. The Mayor's office provided final approval in the Plan adoption.</p>
<p><b>Assessing Vulnerability: Using GIS to Identify Hazard Risks</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  Until 2002 during the hazard mitigation planning process, Kaua'i County did not have a GIS database to assist in planning &amp; permitting, and relied on paper maps. The GIS database was developed for the Kaua'i Hazard Mitigation Plan in 2003 and has been constantly improved and updated. It was developed into a web-based mapping system for planning and permitting. The databases have been consistently updated and organized with metadata.</p> <p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  The updated asset layers and hazard layers were used in the Plan to reassess the risk and vulnerability of the four main planning areas of Kaua'i. These have again been sorted into sectors: Critical Facilities, Emergency Services Infrastructure, Economic Assets, Water Resources, Energy, Telecommunications, Government Facilities, Social, Cultural, &amp; Environmental Assets, and Vulnerable populations.</p> <p>The DFIRMs were updated before the 2009 Plan, and the tsunami evacuation maps have been added to the GIS hazard analysis. A research project on wind hazard risk using topographic analysis of wind speed-up values has been applied to an assessment of building codes.</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The DMC, Kaua'i Civil Defense, and the planning team determined that the maps provided in the 2003 and 2009 Plan were informative for understanding risks and vulnerabilities in communities throughout the county, and that the maps should be updated with the most current data held in the Kaua'i County GIS system. The maps in Chapters 3 and 5 Appendices were reviewed and updated by the planning team and the Kauai County GIS program. The maps were reviewed and approved by the DMC and recommended for inclusion in the Plan. The Mayor's office provided final approval in the Plan adoption.</p>
<p><b>Assessing Vulnerability: Addressing Repetitive Loss Properties</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  Kaua'i County had a few repetitive loss properties, but fewer than other counties in the State of Hawai'i. The 2003 Plan identified the properties and outlined strategies to consider repetitive loss through flood mitigation in permitting and by increasing public awareness of flooding, the need for flood insurance, and the National Flood Insurance Program (NFIP). The county also listed that they would</p>

	<p>investigate the ability to participate in the Community Rating System (CRS).</p> <p>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. One of the changes to the CoK 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.</p> <p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b> The County is working towards participation in the Community Rating System once all of the problems with repetitive loss properties are removed. The County anticipates participation in 2017.</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b> The planning team consulted the Floodplain Manager and the Kaua'i Department of Public Works (which oversees NFIP) for updates regarding NFIP, repetitive loss properties, and flood mitigation policies and outreach. These were reviewed and approved by the DMC and recommended for inclusion in the plan. The Mayor's office provided final approval in the plan adoption.</p>
<p><b>Assessing Vulnerability: Identifying Structures, Infrastructure, and Critical Facilities</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b> For the 2003 Plan, building stock was considered. Since Kaua'i experienced Hurricane Iniki, they had redeveloped better and most of the structures that would fail with high winds had to be replaced. This meant that Kaua'i had improved their housing stock. The county also implemented rim lot setbacks to reduce risks from buildings too close to the edge of cliffs and ridges where winds would speed up because of the topography. The county also implemented a Real Property tax incentive to construct safe rooms for sheltering in strong winds, and improved pet-friendly shelters, such as the Humane Society. The structural risk to emergency facilities has improved with the development of the buildings for Kaua'i Civil Defense, the Police Department, and the Prosecuting Attorney, planned for 24-hour operations in emergencies. Several projects have been funded that include structural mitigation measures for critical government buildings in Kaua'i (including the Pi'ikoi and Mo'ikeha buildings, with award pending on the Historic Building). The county considered potential use of buildings for sheltering and needs for protecting critical facilities vital to the County.</p> <p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b> The risk and vulnerability assessments relied on recent improvements and studies provided. The Kaua'i Island Utilities Cooperative has a long-term Plan to place wires underground, and this coincides with the develop plans such that these improvements will occur with the expansion of roads and developments. In addition, KIUC has implemented redundancy at the hospital, and can do the same for the ports and the airport, which have critical facilities and lifeline operations. The State Structural RVA identified the Lihue Airport as an area for hurricane risk, and since this facility is higher than other airports in the State, it could potentially</p>

	<p>provide an important resource.</p> <p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The planning team consulted the Kaua’i Department of Public Works Building Division and Kaua’i CD on the structural risks of county facilities and housing stock. These were reviewed and approved by the DMC and recommended for inclusion in the plan. The Mayor’s office provided final approval in the plan adoption.</p>
<p><b>Assessing Vulnerability: Analyzing Development Trends</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  The 2003 benefited from the consultative process in developing the County of Kaua’i General Plan in which development trends were identified and analyzed and improvements were identified to meet future demand for resources, housing, and economic improvement. The General Plan significantly informed the development of the 2003 mitigation strategy. The General Plan is only updated every ten years or so, and was scheduled to be updated in 2010, although the state of the economy further limited resources for the undertaking. New data was not available for the update. In addition, the Census was conducted in 2010, with new data analyzed and available in 2011 or 2012. Therefore, the population projections used in the Plan were updated with information from the State of Hawaii Data Book, updated annually and distributed online through the Department of Business, Economic Development and Tourism. The economy has had significant impact on additional development and construction, which has changed some of the projections, but as the economy rebounds, we can expect an increase in development.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  The County General Plan will be finalized after the completion of the 2015 Plan Update, and therefore, the 2015 Plan Update is using updated information from the State of Hawaii Data Book and updated information in the local community development plans that have been underway since 2013. The development trends are analyzed and approved in the General Plan update, and preliminary technical reports and community plans have informed this 2015 Plan Update.</p>
	<p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b>  The planning team with Kaua’i CD consulted the Department of Planning, which oversees the implementation of the General Plan. The gaps were reviewed and approved by the DMC and recommended for actions to address these gaps and overall inclusion in the plan. The Mayor’s office provided final approval in the plan adoption.</p>
<p><b>MITIGATION STRATEGY</b></p>	
<p><b>Local Hazard Mitigation Goals</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  Kaua’i Civil Defense (KCD) and the Disaster Management Committee (DMC) developed their local hazard mitigation goals and objectives, which were approved by the Mayor.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  The revised goals and objectives reflect the current hazard mitigation and disaster risk management needs for the county. The current goals and objectives reflect a shift to Disaster Resilience, and the importance of aligning county initiatives for consistency.</p>
	<p><b>Methods for Analysis and Decisions for Changes in the 2015 Plan update</b></p>

	<p>The planning team with KCDA shared Kaua'i County's previous goals and objectives with the DMC. DMC reviewed, revised, and approved the goals and objectives, and recommended for inclusion in the plan. Consistent with the Mayor's vision for Kaua'i County, the goals and objectives were reviewed and given approval by the Mayor's office through the plan adoption.</p>
<p><b>Identification and Analysis of Mitigation Actions</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  After review of the results of the risk and vulnerability assessment, including consultation by the planning team of government, non-government, and community representatives in Kaua'i County, the team developed a series of mitigation actions that were presented to the DMC who approved the actions for inclusion in the plan. The mitigation actions included were multi-hazard mitigation projects (that could be submitted to different funding sources---not just FEMA) and mitigation policy or programmatic actions that related to reducing the risks through administrative actions or undertaking the policies and programs as a part of "business-as-usual," and these were actions that were supported from in-kind or local resources.</p> <p>The process for identifying mitigation actions (projects requiring external funding) went through the same process as in previous plans. The DMC rated the projects as high-medium-low priority. Since the plan was not approved in March 2010, and revisions were required to reconsider the prioritization, the Department of Public Works and Kaua'i Civil Defense reviewed the projects and suggested numerical rankings to the DMC. The DMC reviewed the list and approved the new prioritization of projects from 1-44, based on the current needs for mitigation and disaster risk management in Kaua'i County.</p> <p><b>Gap Addressed and Change incorporated into the 2015 plan update</b>  While this satisfies a need for numerical prioritization by plan reviewers, the reality is that funds do not become available based on numerical ranking. Some of the projects received support and funding for grants that were particular to the need (equipment, communications, hardening projects, etc.). Regardless of the numerical ranking, the projects on the list were pursued according to the availability of resources for implementation. About two-thirds of the proposed projects were implemented. Those that were not implemented were largely those that did not have financial resources, or as in many cases in Kaua'i, there were not enough human resources to pursue funding requests and coordination for the implementation. The projects are still reviewed and approved by the DMC, and then recommended to the Mayor for approval and incorporation into the plan.</p> <p><b>Methods for Analysis and Decisions for Changes in 2015 update</b>  The decisions for inclusion of projects and policy/programmatic support for disaster risk management have been determined by the DMC. Projects were solicited by the planning team and Kaua'i Civil Defense, then reviewed by DMC and approved for inclusion in the plan. The determination of the prioritization has also been made by and approved by the DMC. The Mayor's office has adopted the plan.</p>
<p><b>Identification and Analysis of Mitigation Actions: NFIP Compliance</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  The 2003 plan included compliance with the National Flood Insurance Program and recommendations for flood mitigation.</p>

	<p>The SCO initiated the most recent 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).</p> <p>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.</p> <p>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.</p> <p>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.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 plan update</b></p> <p>There are several issues related to NFIP that have happened since 2010. The following information is documented in the updated plan. The county came into compliance on the levee issues through mitigation activities. Outstanding issues with repetitive loss properties have been pursued with FEMA and the State NFIP, with some movement and agreement on ways forward early in 2015.</p> <p>The County of Kaua'i is currently in good standing with the National Flood Insurance Program (NFIP) but has outstanding compliance issues relating to a 2003 Community Assistance Visit (CAV), a 2007 CAV, and a 2009 North shore field visit. These issues must be resolved before the CAV can be closed and deal mainly with elevation and building design issues at north shore properties. The County of Kaua'i has submitted documentation to resolve the violations listed in the CAV and the North shore field visit on an ongoing basis since the 2003 CAV was initiated. DPW last responded to FEMA in a letter dated January 16, 2015 and listed four properties where the County of Kaua'i action is still required. DPW anticipates that by the end of 2015 only one property where County action is required will remain and that the CAV can be closed at that time.</p>
	<p><b>Methods for Analysis and Decisions for Changes in 2015 update</b></p>

	<p>The planning team consulted the Floodplain Manager and the Kaua'i Department of Public Works (which oversees NFIP) for updates regarding NFIP, repetitive loss properties, and flood mitigation policies and outreach. These were reviewed and approved by the DMC and recommended for inclusion in the Plan. The Mayor's office provided final approval in the Plan adoption.</p>
<p><b>Implementation of Mitigation Actions</b></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  Because of the experience with Hurricane Iniki and the understanding of impacts of a disaster on Kaua'i County, the County began engaging in mitigation actions as part of their operations, and had already integrated hazard mitigation into many of the departments. They also identified incentive programs and engaged in public awareness. The development of the first mitigation strategy in 2003 coincided with the Project Impact community funding and support that laid the infrastructure for implementing mitigation actions in government, non-government organizations, and communities. The Disaster Management Committee was set up to oversee implementation and advise Kaua'i Civil Defense (primarily responsible for disaster management) and the Department of Public Works (primarily responsible for flood mitigation). The projects for inclusion in proposals related to FEMA funding must be submitted to the State for review. DMC approves Kaua'i Civil Defense and Department of Public Works in proposal submission.</p> <p>Kaua'i County received funding for the implementation of two projects, and is awaiting the award on a third project for building retrofits that protect critical facilities and provide shelter space. There have been several studies that contribute to mitigation improvements, including those conducted by federal agencies, such as Army Corps on evacuation and the NOAA Pacific Services Center in improving flood mitigation decision-support tools. These tools have been critical for assessments.</p> <p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  Kaua'i County continues to recognize the need to partner with federal, state, and local organizations to leverage the resources and funding required for sustaining a long-term disaster risk management program with a focus on building resilience.</p> <p>The interviews, consultations, and meetings conducted by the planning team, continued to reveal numerous mitigation actions underway or completed since the 2003 and 2009 Plans based on partnering with other state and federal agencies. These actions were not well-documented by a single source, and had to be gathered through these series of discussions. There must be better documentation of the implementation of non-FEMA funded mitigation projects, for review by DMC at their quarterly meetings, has been addressed through increased participation in state and county forums. The County has an official representative on the State Ocean Resource Management Hazards and Climate Change Working Group and two voting members on the State Hazard Mitigation Forum. This additional representation provides information for the county on opportunities for mitigation funding, resources, and partnerships.</p> <p><b>Methods for Analysis and Decisions for Changes in 2015 update</b>  The DMC will have responsibility for reviewing implementation and ensuring compliance of county agencies and organizations. The planning team with Kaua'i</p>

	<p>CD made recommendations based on interviews with DMC and other organizations in the county for documenting the implementation for use in future evaluation and update processes. DMC approved the Plan for implementation included in this update. The Mayor’s office provided final approval in the Plan adoption.</p>
<b>PLAN MAINTENANCE PROCESS</b>	
<p><i>Monitoring, Evaluation, and Updating the Plan</i></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>  For the first Plan, a schedule was outlined to monitor progress, evaluate, and update the Plan. The development of Project Impact and the mitigation strategy laid the foundation for considering future input and updates to the Plan.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  The process for the 2009 Plan update, which required an evaluation of the plan, monitoring progress on implementation, and identification of the changes made in the plans and the decision-making processes supporting the changes, has continued to inform the design of this Plan update process and the monitoring that occurred in the five years of this Plan.</p> <p>The Disaster Management Committee will continue to meet quarterly to review actions and ensure implementation of the Plan. Prior to the next Plan update, there will be an evaluation of the effectiveness and implementation of the 2015 update Plan, and this will be used to guide the update currently scheduled for 2020.</p> <p>The process will take into account the annual reviews conducted by the DMC. The Evaluation will be included in the plan in the first chapter of the plan, and mitigation actions will be linked to the findings in the evaluation document that further inform goals and objectives.</p>
	<p><b>Methods for Analysis and Decisions for Changes in 2015 update</b>  The planning team with Kaua’i Civil Defense (KCD) made recommendations to the DMC for the process to monitor and evaluate the Plan. These recommendations included improving the documentation of the implementation of mitigation actions. The DMC approved the quarterly meeting schedule and process for evaluation. The Mayor’s office provided final approval in the Plan adoption.</p>
<p><i>Incorporating into Existing Planning Mechanisms</i></p>	<p><b>Evaluation and Lessons Learned from the 2003 and 2009 Plan</b>  The Kaua’i General Plan is the primary document for ensuring integration of hazard mitigation into existing planning mechanisms. The Mayor’s office can advise the county government agencies to incorporate mitigation practices into ongoing operations and administrative rules.</p> <p>Because of the experience with Hurricane Iniki in the response and post-disaster recovery phase, Kaua’i County gained extensive experience in the importance of including risk reduction measures into their operations. As a result, many of the agencies were already using planning tools for land use and flood mitigation. They were also looking at building codes, design standards, and sheltering. In addition, they had considered sheltering for special needs and pet populations. Kaua’i County set the example for finishing the Plan and including mitigation</p>

	<p>practices: a tax incentive program to build safe rooms, rim lot setbacks to reduce hurricane risks to properties, and consideration during the design phases about hardening county buildings to reduce hazard risks and secure additional shelter facilities. Kaua'i County learned lessons from previous disasters, and worked to incorporate these into existing programs and planning mechanisms. The dam break in 2006, flooding, and rockfalls have continued to contribute to understanding disaster impacts, and these have been incorporated into existing planning mechanisms.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b>  During the 2003 Plan development, the hazard layers were incorporated into geographic information systems (GIS) with a shared license in Kaua'i County government. Following the Plan approval, the County worked with the Pacific Services Center to develop a web-based GIS tool that could be shared among agencies to improve land use planning and permitting to reduce hazards. This system has been maintained and improved, and is the basis of the risk and vulnerability assessments for hazards in the county.</p> <p>Chapter 6 identifies the existing programs and policies that incorporate mitigation. Chapter 6 Appendix highlights best practices in risk management that contribute to disaster risk reduction.</p> <p>Shoreline and coastal erosion have impacted some of Kaua'i's shorelines severely. As part of the coastal management program in the County Planning Department, the University of Hawaii and UH Sea Grant conducted an erosion risk assessment (Chapter 3 Appendix 2). These maps and the assessment data is being used by the county for shoreline management. The data has been used to help draft new shoreline development policies to address erosion and to consider impacts of sea level rise.</p> <p>The County General Plan, which is updated every ten years, is currently underway. Information from hazard risk studies will better inform the county development priorities and exposes potential risk. The County strives to align their initiatives with this 2015 Plan Update, and vice versa, this 2015 Update process references the new studies and local initiatives.</p>
	<p><b>Methods for Analysis and Decisions for Changes in 2015 update</b>  In interviews, consultations, and meetings, the planning team discovered actions that were being undertaken by the county that contributed to mitigation through existing programs. The DMC reviewed these actions in light of the strategy and supported their inclusion. Given constraints on budgets, the DMC is particularly supportive of actions that can be implemented using existing policies, programs, and administrative rules. The Mayor's office provided final approval in the Plan adoption.</p> <p>The community resiliency planning provides an opportunity for the county and state to incorporate this approach into hazard mitigation planning, and this has been the view of the DMC and Mayor, which is supported in the Executive Order adopting this Plan.</p>
<b>Continued Public</b>	<b>Evaluation and Lessons Learned from the 2003 and 2009 Plans</b>

<p><b>Involvement</b></p>	<p>During the development of the 2003 Plan, there were extensive consultations with communities, government agencies, and non-governmental organizations. Meetings were planned in the community districts to get feedback on the risk and vulnerability assessment and mapping products, and to get input into mitigation needs. At the community meetings, it was recommended that future meetings on hazard mitigation needed to occur on the organization or community group’s schedule, and that the planning team and Kaua’i Civil Defense (KCD) needed to Plan in advance to secure time on their agendas. In addition, the Plan’s availability on the website was useful for some public members who were looking for particular disaster-related information; however, there were no comments received from posting on the website. The public who attended the meetings stressed the importance of face-to-face interaction, and that it was unlikely that the general public would make comments online.</p>
	<p><b>Gap Addressed and Change incorporated into the 2015 Plan update</b></p> <p>Based on the recommendations for public involvement, Kaua’i Civil Defense consulted community organizations and scheduled time on their agendas to inform the public about emergency management and hazard mitigation. From 2003 until present, KCD has worked to get on agendas with community organizations to ensure that hazard mitigation became a consideration in the planning of community projects, where localized impacts of disasters will be felt most significantly. Input has been gathered from these communities and organizations and KCD takes this input under advisement.</p> <p>With the limited time for UH planning team’s involvement in the rush to get the Plan done, it was not possible to schedule many meetings in this way. Therefore, information in the update was provided from the input gathered over years of building a relationship with the community.</p> <p>In addition, the Contractor’s Association of Kaua’i has consistently invited the KCD to their annual Home Show and provided booth space for sharing public information. The improved wind ratings for building codes, retrofit methods, and other ways to reduce risk have been featured at the Home Show.</p> <p>The Floodplain Coordinator has further conducted public outreach activities related to changes in the National Flood Insurance Program as they apply to Kaua`i. The State NFIP participated in the 2014 CAK Annual Home Show to discuss flood risks and insurance with participants.</p> <p>Other agencies, such as the Department of Planning, conduct public awareness meetings and seek input in actions that reduce risks, such as the shoreline study or land use decisions. The UH Sea Grant coordinated study with the Planning Office on potential impacts from sea level rise in 2014 provided additional information on future hazard impacts.</p> <p>The County of Kaua’i maintains a website, <a href="http://www.Kaua`i.gov">www.Kaua`i.gov</a>, that provides up-to-date information to inform the general public about risks. The website provides information for those seeking to obtain building or grading permits, information on flood risks through KOHA (previously mentioned), and GIS hazard layers. The</p>

	<p>County provides a one-stop shop for permitting that ensures that the public has access to information. The Plan has been posted on the Kaua'i County Civil Defense Agency website.</p>
	<p><b>Methods for Analysis and Decisions for Changes in 2015 update</b>  KCDA is the primary agency that links with the community and general public about natural hazards. The Floodplain Coordinator in the Department of Public Works has further conducted outreach activities related to flood mitigation. The County provides good information on their website to keep the general public in the county well-informed about ways to reduce risks. In terms of public comment specifically on the mitigation Plan update, this was primarily sought by the planning team through consultation and interviews. The input was reviewed and approved by the DMC and recommended for inclusion in the Plan. The Mayor's office provided final approval in the Plan adoption.</p>