Final Report:
Sea Level Rise and the Impact on Economic Activity in Coastal Communities
A Workshop for the U.S. Virgin Islands

Recommendations for Governor Kenneth Mapp
and the Virgin Islands Climate Change Council

April 2017

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Preface

The recommendations contained in this report build on discussions and recommendations made by the resource team at the Governors’ Institute on Community Design workshop held February 15-16, 2017 in St. Thomas for Governor Kenneth E. Mapp and the U.S. Virgin Islands Climate Change Council. The purpose of this report is to provide further information and resources in detail to support Governor Mapp’s administration and the Council’s work.

On behalf of Governor Mapp, Senator Shawn-Michael Malone, Chair of the Climate Change Council, invited the Governors' Institute to provide expert advice on how to protect life and property and increase resilience in the U.S. Virgin Islands. During the workshop, the Governors' Institute's resource team led discussions with the participants about mitigation and resilience policy, current priorities, and strategies for taking action. Based on these discussions the Governors' Institute, with the help of the resource team, created the set of recommended actions outlined in this report.

The resource team consisted of the following individuals:

- Matthew Gonser, AICP, Extension Agent, University of Hawai'i Sea Grant College Program
- Dr. Gavin Smith, Director, Department of Homeland Security's Coastal Resilience Center of Excellence; Research Professor, University of North Carolina at Chapel Hill
- Dr. Missy Stults, Climate Adaptation Specialist

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The Governors' Institute on Community Design team thanks Governor Mapp for his leadership and commitment to making the U.S. Virgin Islands more resilient to climate change; and Senator Malone and Angela Belfon for helping to develop the workshop; and the Council members, agency directors, and other stakeholders who attended the workshop for their participation in the discussion.

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About the Governors' Institute on Community Design

The Governors' Institute on Community Design® is a national, nonpartisan program that provides assistance to governors, their cabinets, and their senior staff in developing policies and implementation tools to guide growth and development in their states. Harnessing the policy expertise of leading practitioners in a range of fields—including land use, design, transportation, economic development, resilience and regional planning—the Governors' Institute provides each state's executive team with practical solutions to the issues they face in order to enhance communities and build places where companies and people want to invest. Visit www.govinstitute.org for more information.

Introduction

In October 2015, Governor Kenneth Mapp signed an executive order establishing a Climate Change Council and directing the Council to create a climate adaptation plan to prepare the Territory for the impacts of climate change.

On February 15 and 16, 2017, the Governors' Institute on Community Design (GICD) held a two-day workshop for Governor Mapp to identify opportunities, specifically within the Hazard Mitigation Planning process, to strengthen the ability of the Virgin Islands and its agencies to adapt to a changing climate.

The GICD team worked with Senator Malone and his team to develop an agenda and resource team to tackle the issues facing the Territory. Day 1 began with a welcome from Governor Mapp and Lt. Governor Potter, and discussions focused on sharing critical information, exploring strategies for reducing risk, and building long-term resilience. Members of the Council also educated the GICD team on the unique issues facing the Virgin Islands and the community's priorities. The second day began with a review of issues raised by the group, and continued with a presentation of draft recommendations for the Virgin Islands and a discussion of how the Climate Change Council could operationalize them.

Recommendations that were identified as being feasible are outlined in this report. The workshop concluded with a discussion of who is missing from the table, which included many of the Climate Change Council members. Without the participation of all Council members, key stakeholders, and the public, it will be challenging to identify appropriate decisions and key actions that will allow the Territory to holistically plan for and build resilience to climate change. As such, commitment to this initiative is critical for productive conversations and collective agreement prior to action.

The Governors' Institute encourages Governor Mapp and the Climate Change Council to take advantage of this opportunity to take specific steps towards a more resilient Territory.

Recommendations

1. Develop and commit to a "resilience vision" for the Virgin Islands

Discussions throughout the workshop recognized both the cultural and capacity challenges in the U.S. Virgin Islands to take action to address slow-approaching as well as rapid-onset hazards and disasters when they occur. The recommendations in this first section are tied to the importance of creating a resilience-based vision and then taking the steps necessary to make the vision a reality.

1a. Define the resilience vision and goals for the Territory as part of a larger planning process

Resilience can have many different meanings. We suggest drawing insights from the National Academy of Sciences (NAS), which defines disaster resilience as "the ability to plan and prepare for, absorb, recover from, and adapt to adverse events" (NAS 2012). This definition accounts for both episodic and slow-onset hazards as well as recognizing that pre- and post-disaster timeframes provide an opportunity to advance a resilience-based vision and accompanying goals.

It is critical for the Territory to decide what kind of place it wants to be, and what are the priorities for protecting the islands from natural hazards, including those directly and indirectly influenced by a changing climate. A plan's vision provides a description of an aspirational future, including the underlying themes the plan is designed to address. By establishing a resilience-based vision, for instance, the Territory will be able to articulate what it aims to be.

The vision should be thought of as an overarching statement that sets a clear path for the Territory to adopt and serves as the main reference point for all agencies and their associated goals. With a cross-disciplinary issue like resilience, articulating a single vision is an important step towards ensuring that staff across government is coordinating around a common aims. Once a common vision and associated goals are established, the Territory can then begin measuring progress towards achieving those goals. Goals are value-based statements that provide direction for implementing the plan's larger vision. Given a vision tied to resilience, one option to consider is to base goals on social, economic, environmental, and physical dimensions described in the resilience literature.

In order to achieve identified goals, it is imperative that a clear implementation strategy is developed, to include identifying parties responsible for carrying out associated policies and projects (often framed as a standing committee comprised of stakeholders involved in hazard mitigation and climate change adaptation activities), establishing clear timelines for completion (implementation timelines should account for individual and interdependent policies and projects), and linking goals, policies, and projects to the resources (funding, staff, data, and technical assistance) needed to accomplish them. It is also important to establish a strong monitoring process that allows for the committee to track progress and update the plan over time. This should include an agreed upon time for regular updates (e.g., every 5 years) as well as reviewing and updating the plan following disasters as extreme events often test the efficacy of the plan and may expose areas that need to be addressed but were unforeseen during the plan's initial development.

Case Study: City of Santa Cruz Climate Adaptation Vision

The City of Santa Cruz, in developing their Climate Adaptation Plan,[1] established the

following as the community's vision:

> "The City of Santa Cruz endeavors to be a climate resilient community preparing for potential impacts of climate change, while preserving the diversity and quality of its natural and built environments. The community strives to offer excellent cultural and community services as well as to protect, preserve and improve infrastructure, community safety and emergency preparedness. It is the City's intention to build resilience into policies, programs, projects and infrastructure."

1b. Align agency goals and budget with the resilience vision

To fully commit to a resilience vision, it must be integrated into all agencies and activities of the Territory. This will require conducting an audit of all agencies, programs, and budgets to fully understand how current resources and planning efforts are advancing or hindering resilience goals. Understood in the context of planning, this is often referred to as a capability assessment.

As part of the assessment, plans and policies and projects within plans should be identified and reviewed to see if policies and projects help or hinder the achievement of the larger vision of enhancing resilience. Relevant plans worthy of review include: hazard mitigation, coastal management, environmental management, economic development, capital improvement, transportation, and climate change adaptation plans. Other plans may be worthy of review based on the fact-finding process conducted by a standing committee. A powerful and easy to use guide to build an assessment from is the Safe Growth Audit developed by David Godschalk.[2] This document provides a checklist of actions governmental officials can use to assess the degree to which plans and policies increase or decrease resilience.

A process should be created and applied to review these plans using current resilience data and climate projections, along with pre-established criteria to determine if proposed policies and projects are resilient to natural hazards based on current and future conditions (Recommendation 2a). This process should then be applied to all departments under the direction of the agency and committee charged with implementing the resilience plan and associated vision (Recommendation 1c). This final step of the assessment can help ensure that agency spending better aligns with the Territory's resilience goals and does not hinder them. Ideally, this assessment and the larger plan, addresses the importance of reaching out to non-governmental actors, including members of the private sector, non-profits and foundations, quasi-governmental organizations and groups that emerge after disasters.

Case Study: Integrating Climate Change into Capital Improvements Planning in San Francisco[3]

In their 2016-2017 Capital Improvements Plan, the City of San Francisco intentionally created a resiliency frame by which all of the various projects must be evaluated. The report indicates that "a fundamental responsibility of the City and the Capital Planning Committee is to develop and implement policies and programs to improve the overall resiliency...of San Francisco's infrastructure." In addition, the plan outlines the specific sea level rise projections that all capital projects must consider during their conception, design, and implementation phase in order to be fully considered for capital investments.

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[1] http://www.cityofsantacruz.com/home/showdocument?id=23644

[2] https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/zoningpractice/open/pdf/oct09.pdf

[3] See: http://onesanfrancisco.org/wp-content/uploads/2-RES_FINAL.pdf

1c. Put someone in charge

To implement the resilience plan and associated vision, the Territory must ensure that efforts are coordinated across agencies and decision-making bodies as well as the larger governance system noted in 1b. To do this, there must be a clear, central authority on resilience with the capacity to work with and influence agencies and decisions. Creating an executive office of resilience or similar authority within the governor's administration sends a clear message that resilience is a priority.

While the Climate Change Council can and should play a role in coordinating across agencies and other identified non-governmental stakeholders setting priorities for the administration, a single point of contact is essential. The Council can solicit input and expertise in data collection, community engagement, capacity building, project implementation, and general resilience issues. However, a central coordinator for resilience is key to convening the many agencies that impact resilience through their investments, programs, and infrastructure projects. To be successful, this person/authority must have a clearly articulated mandate from the governor and be a strong leader with authority to make decisions and make the Territory's resilience vision her or his top priority and responsibility.

It is important to note that there are multiple mechanisms to ensure coordination. There are specific political or organizational benefits and challenges for an executive office of resilience versus a sub-cabinet position focused on resilience. Either way, the individual must have clear authority, charge and mandate that provides focus and goals within the broad topic of resilience. For example, New York Governor Andrew Cuomo established the Governor's Office of Storm Recovery in 2013 with four main focus areas: housing recovery, small business, community reconstruction, and infrastructure. Other models to consider include the creation of a Chief Resilience Officer[4] or the hiring of a Sustainability Director or Planner[5] that is charged with coordinating resilience and sustainability initiatives throughout the Territory.

Case Study: Colorado Resiliency & Recovery Office and Colorado Resiliency Framework[6]

Originally established to coordinate the 2013 flood recovery efforts, the Colorado Resiliency & Recovery Office (CRRO) also spearheaded the development of a long-term resiliency roadmap for Colorado. Today, CRRO serves a dual role as the resiliency lead for the State, and coordinator of the State's flood recovery efforts. In both roles, CRRO collaborates with interdisciplinary local, state and federal agencies and non-government partners. It is focused on the long-term needs of the State of Colorado.

Similar to the Virgin Islands, the CRRO held a summit of state and federal leaders to identify opportunities to build resilience as a part of the recovery process as well as part of day-to-day actions. Summit participants talked about what resiliency meant and how the State of Colorado could take action. As a result of the summit, the CRRO formed the Colorado Resiliency Working Group made up of stakeholders from government and other parties. The Working Group identified the statewide resiliency goals and strategies and served as the steering committee preparing a Colorado Resiliency Framework.

The Framework, which took about one year to prepare, was officially adopted by Colorado Governor John Hickenlooper in May 2015, stating:

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[4] http://100resilientcities.org/blog/entry/what-is-a-chief-resilience-officer1

[5] http://www.sustainablecitiesinstitute.org/topics/equity-and-engagement/sustainability-planning/sustainability-staff/what-is-a-sustainability-officer

[6] Colorado Resiliency Framework 2016 Annual Plan, https://drive.google.com/open?id=0B_gHrzLAL2NTb3BiVFBaVkQtOFU

> "Communities throughout the state have been impacted by blizzards, wildfires, floods, tornadoes, and even an earthquake in the past decade. Through these disasters, Coloradans have shown great resolve to build back stronger which we want to continue to empower. The Framework is one more example of Colorado developing innovative solutions to build a better future… the state seeks to not only support efforts to build back, but to support communities in their efforts to thrive in the face of threats from hazards and changing conditions."

The framework serves as a guide for the CRRO's long-term resiliency mission and focuses on the following sectors:

- Economic: Whether the economy can continue to function and rebound from a sudden shock;
- Community: Whether community members and institutions are engaged and have the tools needed to make resilient decisions;
- Health and Social: Whether all levels of society share in the community's health and well-being;
- Housing: Whether community members have access to safe, secure and affordable housing that uses durable construction materials and is designed to limit vulnerability to natural disaster;
- Watersheds and Natural Resources: Whether these resources are conserved, provide community benefit, are able to withstand disturbances and protect infrastructure and other aspects of society; and
- Infrastructure: Whether infrastructure is engineered to resist and recover quickly from shocks.

For each sector, the Framework identifies shocks and chronic stresses that may impact Colorado, and summarizes the specific problems Colorado may face in being prepared for the identified shocks and stresses. For example, the Framework summarizes the infrastructure sector as follows:

- Shocks: Numerous fires and floods in recent years; cyber attacks and other technology crimes.
- Stresses: Aging infrastructure; increasing population; energy generation and distribution systems reaching capacity; climate, including Colorado's severe freeze / thaw cycles; and, changing climate trends.
- Problems:
    - Communities across the state need asset risk assessments and management tools to understand the threats and vulnerabilities of infrastructure they control as well as how to prioritize opportunities to reduce vulnerabilities.
    - There is no common definition of "resiliency" and inconsistent design standards.
    - Funding limitations do not allow criteria for project evaluation or to prioritize / implement improvements.
    - Infrastructure is not seen as interconnected between jurisdictions and there are no incentives to change this frame.

The Framework outlines specific strategies for the identified problems for each sector within the goals of reducing risk, increasing resiliency planning capacity, creating and streamlining policies, cultivating a resiliency culture and ingraining resiliency into investments. For example, in the infrastructure sector, a recommended strategy for the goal of reducing risk is to create a centralized database for hazard data and to identify any information gaps in this data.

Finally, the Framework outlines a "resiliency roadmap"—a call to action for the State of Colorado to realize a more resilient future. This Roadmap defines the roles of the Governor's office and cabinet, CRRO, Resiliency Working Group, and local communities in planning for resiliency.

1d. Expand the hazard mitigation planning process to include climate change

One method for implementing these decisions is to alter the hazard mitigation planning process to include climate change strategies, proactive land management, scenario planning, and adaptation into disaster recovery. Methods for influencing these decisions are discussed under Recommendation 2. However, the Council can begin to take action on this immediately by creating a joint Hazard Mitigation Plan and Climate Adaptation Plan. As discussed during the workshop, this is an opportunity to work within existing frameworks rather than creating a new structure. To accomplish this, commitment is needed from the key agency heads such as VITEMA and DPNR.

A draft checklist[7] for how climate change could be integrated into hazard mitigation plans was provided during the February 15-16th workshop. It is highly recommended that the Council use this checklist as a guide for determining how best to integrate climate change into the Territory's hazard mitigation plan as well as devise a strategy for how to more holistically integrate climate change into future plan updates.

Case Study: Marrying Climate Change and Hazard Mitigation Planning in Baltimore, MD[8]

Created in 2013, the Baltimore Disaster Preparedness and Planning Project Plan (DP3) simultaneously addresses preparing for natural hazards as well as climate change. The goal of DP3 was to create a "city whose daily activities reflect a commitment shared by government, business, and citizens to reduce or eliminate impacts from current and future natural hazards." Six sub-goals were established to guide the City through the planning process and to evaluate the overall successful implementation of DP3:

1. Protect the health, safety, and welfare of Baltimore City residents and visitors.
2. Prevent damage to structures, infrastructure, and critical facilities.
3. Build resilience and disaster prevention and planning into all programs, policies and infrastructure.
4. Enhance the City of Baltimore's adaptive capacity and build institutional structures that can cope with future conditions that are beyond past experience.
5. Promote hazard mitigation and climate adaptation awareness and education throughout the city of Baltimore.
6. Become a Community Rating System (CRS) classified community.

Through the DP3 process, a 42-member Advisory Committee and several working groups worked with the City to identify six major hazards of immediate or future concern to the community: flooding, coastal hazards (e.g., hurricanes, sea level rise, storm surge, coastal inundation), precipitation variability (e.g., winter storms, drought); extreme wind, extreme heat, and air quality. The Advisory Committee identified four key sectors already affected or likely to be affected by these hazards: infrastructure, buildings, natural systems, and public services. Per the traditional FEMA hazard mitigation planning process, the City utilized the following process to develop DP3:

1. Identify and profile existing hazards.
2. Conduct an inventory that identifies all assets such as hospitals, schools, etc.

[7] See Appendix A
[8] http://www.baltimoresustainability.org/plans/disaster-preparedness-plan/

3. Utilize modeling to identify risks from existing hazards and predicted climate impacts.
4. Complete a vulnerability analysis of identified assets and critical facilities. Identify exposure, sensitivity, and adaptive capacity.
5. Identify actions and recommendations to deal with existing hazards and predicted impacts.
6. Develop implementation plans for these actions, as well as recommendations for stakeholder involvement and funding strategies.

A growing number of states and communities are pursuing similar integrative strategies and drawing lessons from these efforts can inform the Virgin Islands planning process. We suggest drawing on the findings of a national study of climate change adaptation plans that examines how plan quality varies across communities and found that plans draw on multiple data sources to analyze future climate impacts and include a breadth of strategies, but also lack of implementation strategies.[9] An additional important source of information can be found at the Georgetown Climate Center.[10]

1e. Expand the disaster recovery process to include climate change planning

A final commitment to the Territory's resilience plan and associated vision should involve expanding disaster recovery initiatives so that they are holistically focused on recovery in a more resilient, sustainable fashion to include accounting for climate change adaptation. This can prove particularly important as following major disasters, millions of dollars in aid may be available. The wise expenditure of this funding should include injecting climate change measures into the reconstruction process. Rebuilding damaged housing, infrastructure and critical facilities to pre-event conditions or adopting hazard mitigation strategies that don't account for climate-based uncertainty, sets the stage for future disasters in an era of climate change. Techniques that can address these concerns include:

- Creating voluntary guidance that encourages all those requesting permits to integrate climate considerations into their design or upgrades (e.g., Boston[11]). This guidance could eventually be made mandatory. Examples include the adoption of more stringent building codes, additional freeboard or building setbacks in flood-prone areas, developing guidance for state agencies to account for climate change in repairs to damaged facilities and infrastructure, and seeking to incorporate hazard mitigation measures into FEMA's Public Assistance-based repairs;
- Identifying vulnerable parcels of land and creating a proactive strategy to buy-out those properties in the case of a disaster and turn those areas into open space. These vacant parcels are often turned into parks or other public land that help to reduce future losses; and,
- Adopting land-use strategies that limit future development in areas prone to flooding and future sea level rise.

Case Study: Florida Post Disaster Redevelopment Planning[12]

The Florida Post-Disaster Redevelopment Plan (PDRP) is an initiative of the Florida Divisions of Emergency Management, Community Development, and Environmental Protection. The PDRP created a guidebook to assist communities in preemptive planning for post-disaster needs. The key goal was to help communities recover more quickly and

[9] Numerous strategies but limited implementation guidance in US local adaptation plans: http://www.nature.com/nclimate/journal/v6/n8/full/nclimate3012.html
[10] http://www.georgetownclimate.org/
[11] http://www.bostonplans.org/planning/planning-initiatives/article-37-green-building-guidelines
[12] http://www.floridadisaster.org/Recovery/IndividualAssistance/pdredevelopmentplan/

thoughtfully from future disasters and create a standard process to assess locally specific risk.

Creating a PDRP prior to experiencing a disaster offers Florida communities the following benefits:

- Faster and more efficient recovery through identification of appropriate planning mechanisms, financial assistance, as well as agency roles and responsibilities.
- The opportunity to rebuild better than before the disaster because communities create a guiding vision that prevents short-term decisions from restricting sustainable long-term redevelopment and overshadowing opportunities to exceed the status quo.
- Local control over recovery through an opportunity to assess risk and create long-term redevelopment plans in advance.

A PDRP requires support from community leaders at all levels, particularly those potentially involved in disaster recovery. Participation by stakeholders and the general public is also critical during development and implementation of the PDRP.

Case Study: Post-Disaster Rebuilding Guidelines and Protocols, County of Maui, Hawai'i

With resilience in mind, the County of Maui, Hawai'i, asked itself, how will we rebuild following a coastal disaster? A lot of work goes into the emergency response for disasters, but until a disaster strikes, most coastal managers do not realize the enormous post-disaster roles and burdens placed on them. Permitting agencies will face intense scrutiny following an extreme event, and communities will expect immediate direction about the rebuilding process. Clear guidelines for rebuilding are needed and the County of Maui engaged in a community-based, pre-planning process to develop post-disaster rebuilding guidelines and protocols with the goals of developing public messages for the time period immediately following a disaster and an expedited permitting process for reconstruction. [13]

All too often the recovery effort is singularly focused on the speed of recovery rather than taking a more deliberative approach that is needed to reflect on measures that can be taken to enhance resilience. Achieving the right balance between speed and deliberation is key to a successful recovery.

The project and process engaged community stakeholders to develop Rebuilding Guidelines and Protocols that:

- Expedite the rebuilding process;
- Triage actions to address immediate and long-term needs;
- Protect sensitive environmental and cultural resources;
- Respond in a planned manner without arbitrary and capricious decisions;
- Incorporate appropriate mitigation and adaptation strategies to become a more resilient community;

All so that the communities are "Building Back Safer, Stronger, Smarter, & Faster!" This approach is being expanded statewide across Hawai'i's four counties and eight inhabited islands.

Given the Council's cross-agency membership and strong interest in community engagement, a guide focused on the concept of a Post Disaster Redevelopment Plan may be an ideal project for the Territory to pursue.

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http://files.hawaii.gov/dbedt/op/czm/ormp/working_group/meeting_presentations/wg_presentation_20150604_mauipostdisaster.pdf

Additional information worthy of review include the Environmental Protection Agency's work on linking smart growth, disaster resilience and recovery, including specific projects developed following Hurricane Irene in Vermont. For more information, please see:

- Planning for Flood Recovery and Long-Term Resilience in Vermont: Smart Growth Approaches for Disaster-Resilient Communities[14]
- Vermont State Agency Policy Options. Smart Growth Implementation Assistance Program: Disaster Recovery and Long-Term Resilience Planning in Vermont.[15]

1f. Ensure all future plans integrate climate change

After committing to a resilience plan and associated vision, it is critical to ensure that all plans and future plans integrate climate change. As discussed in Recommendation 1b, future plans must consider climate and support the established resilience vision. This includes hazard mitigation, capital improvement, as well as housing, transportation, waterfront development, stormwater, water, and other infrastructure investment plans and programs.

To help guide this integration, the Territory should strongly consider creating standardized climate change information that all agencies should be using to guide planning efforts. For example, how much sea level rise should agencies be planning for? How can the Virgin Islands account for more intense rainfall events and more severe coastal storms? What measures should be put in place for more extreme droughts? One way to approach this is to utilize the Fourth National Climate Assessment, currently underway.[16]

Additionally, partnerships with local academic institutions, nonprofits, and federal agencies can help to create this guidance. For an example of what this looks like in practice, see the City of San Francisco,[17] Association of Bay Area Governments or the Southeast Florida Climate Change Compact.[18]

In an effort to support local governments in planning for existing hazards and preparing for future hazards due to climate change, the Association of Bay Area Governments' Resilience Program and the Bay Conservation Development Commission (BCDC) Adapting to Rising Tides Program are partnering to create a process that will support the update and development of hazard mitigation and climate adaptation plans.[19] Integrating hazard mitigation planning, which focuses on historic risks, with climate adaptation planning, which focuses on future risks, will provide clear guidance and a unified strategy to support community sustainability and resilience.

Case Study: Hawai'i Climate Change Adaptation Priority Guidelines[20]

Act 286 (2012), Climate Change Adaptation Priority Guidelines, was passed by the Hawai'i State Legislature and signed into law by former Governor Neil Abercrombie. Hawai'i is one of few states in the nation to adopt a statewide climate adaptation policy for addressing the impacts of climate change. Act 286 is codified as HRS § 226-109.[21] Because the policy is an amendment to the Hawai'i State Planning Act, all county and state actions must consider the

[14] https://www.epa.gov/smartgrowth/planning-flood-recovery-and-long-term-resilience-vermont
[15] http://accd.vermont.gov/sites/accdnew/files/documents/CD/CPR/CPR-SGIA-StateAgencyPolicyOptions.pdf
[16] http://www.globalchange.gov/nca4
[17] http://onesanfrancisco.org/wp-content/uploads/2-RES_FINAL.pdf
[18] http://www.southeastfloridaclimatecompact.org/
[19] http://resilience.abag.ca.gov/projects/2016-mitigation-adaptation-plans/
[20] http://www.capitol.hawaii.gov/session2012/bills/GM1403_.PDF
[21] http://www.capitol.hawaii.gov/hrscurrent/Vol04_Ch0201-0257/HRS0226/HRS_0226-0109.htm

policy in its land use, capital improvement, and program decisions. The Office of Planning is currently working with various stakeholders, primarily through the Ocean Resources Management Plan (ORMP) program, to implement the policy. The ORMP includes county, state, and federal stakeholders who implement public projects and programs. The ORMP is a coordinated effort that includes input from the community, businesses, and non-profits who contribute to and support these efforts.

2. Increase capacity to influence proactive land use and development decisions

As discussed above, a person/authority should be established to implement the Territory's resilience plan and vision. Proactive land use decisions and specific evaluation of proposed development will reduce future risk and increase overall resilience. Recommendations in this section are focused on activities that support those decisions and are intended to help the Territory increase their overall capacity and funding.

2a. Develop criteria to evaluate proposed projects or policies and address assets already in high-risk areas

Land use and development was a common theme discussed during the workshop, ranging from proposed zoning rewrites to increased codes and standards. To promote development that increases the resilience of the Territory, criteria are needed to evaluate and prioritize policies and projects based on factors such as cost, data-backed risk projections, historical trends, need and capacity assessments, environmental impact, economic development potential, regional impact, public health impact, and social benefits. The exact metrics and relative importance of each criterion should be developed with the full participation of the Council and the person/authority charged with carrying out the resilience vision (recommendation 1c). One avenue to consider is the growing emphasis on indicators of disaster resilience and their use in practice. For instance, FEMA has developed draft guidance on this topic.[22] This document established a proposed set of national indicators. For an example of indicators created at the local level, please see the following examples.

In the private sector, the main tool for influencing development is the permitting process. A first step towards reducing future risk for the Territory is to create voluntary guidance that encourages all those requesting permits to integrate climate considerations into their design or upgrades. This guidance could eventually become mandatory or at minimum financially beneficial to those making the investments—rewarding better, more resilient development. Conversations at the workshop suggested working with the Department of Planning and Natural Resources to ensure that permitting in the first tier of the coastal zone promotes development that increases resilience and reduces risk.

Another way to build resilience is to support homeowners when they are making decisions about their own properties. Guidance on how renovations can increase resilience is available in multiple states, each addressing the unique environments and challenges homeowners face. Similar guidance will be created along with the guidance around permitting for Virgin Islands homeowners and their specific needs. An example of this guidance can be found in recommendation 3b, which discusses increasing capacity.

In addition, it is important to address assets in high-risk areas. As discussed at the workshop, the expansion of the waterfront boulevard, Veterans Drive, presents an opportunity to both increase resilience and avoid increased risk. Care should be taken to

[22] https://www.fema.gov/media-library-data/1466085676217-a14e229a461adfa574a5d03041a6297c/FEMA-CRI-Draft-Concept-Paper-508_Jun_2016.pdf

fully evaluate all potential alternatives for Veterans Drive, with full integration of climate change considerations, to ensure that any money invested in the project accounts for current and future projected hazards.

As mentioned in Recommendation 1b, a resource to address similarly contentious issues is the Safe Growth Audit developed by David Godschalk.[23] This document provides a checklist of actions governmental officials can use to assess the degree to which plans and policies increase or decrease resilience.

Case Study: Miami-Dade County Mitigation Action Prioritization[24]

In Miami-Dade County, Florida, a working group made up of state agency, non-profit, and local leaders developed a mitigation action prioritization tool to quantify the long-term benefits of proposed resilience projects based on cost, suitability, and risk reduction potential. This model improved the often-contentious and competitive process of project selection and ultimately funded a range of improvements, from vegetation management to modifications to the local canal system.

The program helps to pre-identify and to prioritize local projects at the county and community levels that could help reduce the region's vulnerability to losses from future disasters. It also helps streamline the mitigation efforts in Miami-Dade County. However, it is critical that the stakeholders do not view projects as simply a list without a clear implementation strategy guided by a larger set of goals and community vision. Doing so diverts attention from the strategies behind the local mitigation efforts. Goals need to be continuously updated as the priorities and needs of the region change.

Case Study: Charlotte-Mecklenburg, NC Floodplain Buyout Program

The Engineering and Mitigation Program within Charlotte-Mecklenburg, North Carolina's Storm Water Services Division (CMSWS) is the local authority in charge of analyzing flood hazard risk and for prioritizing properties for appropriate mitigation projects. These projects range from property buyouts to environmental restoration and are funded primarily through stormwater utility fees.

The agency is currently in the process of remapping its regulated floodplains. This effort is occurring in four phases, with the first phase going into effect in 2014 and the final phase continuing through 2018. In 2000, Charlotte-Mecklenburg became the first U.S. community to show on its official maps both the current floodplains (FEMA floodplains) where flooding is expected to occur now and its Community Floodplain where flooding is expected in the future.[25]

The CMSWS flood risk mitigation program has two key elements. First, the Floodplain Buyout (Acquisition) Program, which has the agency make purchases and remove buildings that are likely to flood repeatedly. This voluntary program has purchased 374 homes, apartment buildings, and businesses as of the end of 2016 located in the highest risk portions of local floodplains. Located in more than a dozen neighborhoods along various creeks, the program has relocated more than 600 families. The buyout program has been in place since the late 1990s.

The impetus for the program was several back-to-back floods that occurred at that time. The floods increased public and political support for an alternative to buying flood insurance and

[23] https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/zoningpractice/open/pdf/oct09.pdf
[24] http://www.miamidade.gov/fire/mitigation.asp
[25] http://charlottenc.gov/StormWater/Flooding/Pages/FloodplainsandMaps.aspx

hoping for the best. The community recognized that floodplains are intended to flood and store water and it would be best to relocate buildings out of hazardous areas.

The agency also has implemented a quick buyout program following major flood events. This is funded by local money through a rainy day fund. Doing pre-flood planning and identifying areas they would like to acquire properties, the acquisitions can be completed quickly after an event before homeowners make repairs or flood-proof their homes from future events. This saves money and helps people move out of the floodplain at a time when their interest is likely to be highest. This program is also able to complete acquisitions quickly – in just 3-9 months – versus 3-4 years likely under FEMA programs (where homes are usually repaired before they are acquired). The program has been implemented three different times in the last 15 years.

After acquisition, the Engineering and Mitigation Program within CMSWS restores the floodplain to its natural state enabling it to store and filter excess rainfall and runoff. This may include parkland, gardens, greenways, and other similar uses. The local police and fire departments may utilize acquired properties for training prior to demolition or relocation.[26]

A second program offered by the Engineering and Mitigation Program within CMSWS is the retroFIT Program.[27] This effort offers financial and technical assistance to existing building owners not participating in other mitigation efforts. Started in October 2015 after Board of County Commissioners approval, the program has a goal of making dwellings more resilient.

The authorization for the program passed by the North Carolina legislature in 2014, which allows Mecklenburg County to use stormwater utility fees to implement flood damage reduction techniques in order to improve private property.[28] CMSWS worked with the legislature to pass this authorization to ensure North Carolina's stormwater language would allow them to use their funds to make improvements on private property. The legislature received feedback from various stakeholders resulting in fairly detailed criteria for the program.

The agency realized that floods impacted many people who would not make it to the top of the Floodplain Acquisition Program buyout list due to the characteristics of their site or that the agency would be unable to service. This program also provided an opportunity to keep rising flood insurance rates down by doing some mitigation measures to properties.

Residential and commercial property owners may check their eligibility for participating in the program online. Their habitable building must be located in the community-designated floodplain and be able to be modified to reduce or prevent future flood damage. The program generally provides grants for 75% of qualified mitigation project costs. Depending on a property's tax value or the owners' enrollment in programs for low income or disabled individuals, certain owners may receive up to 95% of the project cost.

More in-depth information on the methodology and history of the program can be found in the report *Hazard Mitigation: Integrating Best Practices into Planning.*[29]

2b. Add capacity within the Governor's Office or a key agency

To oversee the development and implementation of the criteria, staff with experience in land use policy and development is needed. This role should be shared across agencies like the

[26] http://charlottenc.gov/StormWater/Flooding/Pages/FloodplainBuyoutProgram.aspx
[27] http://charlottenc.gov/StormWater/Flooding/Pages/retroFIT.aspx
[28] http://www.ncga.state.nc.us/EnactedLegislation/Statutes/HTML/ByArticle/Chapter_153A/Article_15.html
[29] https://www.planning.org/publications/report/9026884/

Department of Public Works and the Department of Planning and Natural Resources, or they could be based within the Governor's Office and provide oversight to relevant agencies and private development proposals. Options include hiring a planner or applying for a ResilienceCorps Fellow[30] (part of AmeriCorps). This increased capacity would directly support the person/authority charged with carrying out the resilience vision (1c), as well as the Council. An additional example already discussed includes the approach adopted by the State of Colorado.

A resource from the University of North Carolina's Coastal resilience Center focuses on the roles played by state players in disaster recovery following extreme events and includes interviews with governors and the roles they play as well as an associated training guide.[31]

2c. Identify techniques to mutually advance multi-hazard mitigation and climate adaptation

An opportunity to increase capacity discussed at the workshop is leveraging funding sources and activities that address multiple hazards and/or mitigation to advance climate adaptation goals. For example, funding to plan for and mitigate tsunamis can be used to address the risk of sea level rise. If done holistically, this approach may well lead to the Territory securing more funding to implement comprehensive programs that reduce risk through an increased number of funding partners.

As the Territory makes investments, it is critical to identify co-benefits to leverage scarce resources and to inject risk reduction into all activities. For example, since schools are used as emergency shelters, funding for the use of schools as emergency management resources can help to raise the capital needed to build the resilience of schools. This win-win strategy helps protect students every day while also building the resilience of the local community.

Case Study: Seattle Neighborhoods Actively Prepare

The City of Seattle created the Seattle Neighborhoods Actively Prepare (SNAP) program to help neighborhoods get organized so that they can proactively prepare for disasters. There is an online toolkit[32] that provides practical step-by-step instructions on neighborhood organizing, a personal touch through face-to-face interactions with the Office of Emergency Management, and grants to help purchase needed disaster-ready supplies. The SNAP program also builds neighborhood social cohesion and adaptive capacity so that, regardless of the disaster, the neighborhood is ready and able to take care of one another.

2d. Leverage peer-to-peer exchange network

There are other communities facing very similar challenges to the Virgin Islands, and many are beginning to tackle resilience-based issues. The Puerto Rico Climate Change Council, other territories, and states like Hawai'i, North Carolina, and Florida are just some of the actors actively working to build resilience.

In addition, there is a territorial body of National Emergency Management Association that has the potential to support the Territory in its efforts. The person/authority charged with carrying out the resilience vision (recommendation 1c) should serve as a liaison to these

[30] https://www.nationalservice.gov/programs/americorps/americorps-initiatives/resilience-americorps
[31] http://coastalresiliencecenter.unc.edu/crc-projects/the-role-of-states-in-disaster-recovery/; http://coastalresiliencecenter.unc.edu/wp-content/uploads/2016/04/Role_of_States_Training_Guide.pdf
[32] https://www.seattle.gov/emergency-management/working-together/seattle-neighborhoods-actively-prepare

other communities and resources to bring back new ideas and to share lessons learned from the Virgin Islands with others. Another option is to consider networks tied to other professional associations like the Association of State Floodplain Administrators[33] and the American Planning Association's Hazard Mitigation and Disaster Recovery Planning Division.[34]

Case Study: New Hampshire/Vermont Upper Valley Adaptation Workgroup

This bi-state resilience working group, started in December 2011, assembles state and local officials, non-profit leaders, public health networks, regional planning commissions, academic institutions and business representatives to address climate concerns in the region. Its mission is "Building Climate Resilient Communities in the Upper Connecticut River Valley through Research, Information Sharing and Education."[35] The Upper Valley includes the geographic regions of the Two Rivers Ottauquechee Regional Commission in Vermont and the Upper Valley Lake Sunapee Regional Planning Commission in New Hampshire. Tropical Storm Irene and the flooding that followed significantly impacted this area and led to the formation of the Workgroup.

UVAW offers opportunities for community leaders to learn:

- From local case studies
- How to better work with FEMA
- Community engagement techniques
- Economic impacts and opportunities[36]

As many small communities in New Hampshire and Vermont have limited professional staff, UVAW provides them with educational forums and opportunities for networking to learn from each other and begin to make their communities more resilient to climate change. UVAW hosts public education forums on flooding and preparedness using data from a climate assessment of Southern New Hampshire. These forums enable communities to understand the projected impacts, begin to think about their vulnerabilities and plan for future impacts.

2e. Investigate risk transfer options

Parametric, or index-based, insurance solutions settle claims on the characteristics of a disaster, as opposed to the loss sustained from the disaster. Unlike traditional insurance, parametric solutions do not require lengthy loss adjustment processes, and they enable rapid disbursements of payouts to maximize liquidity and allow for flexibility in the use of the proceeds. Payouts can occur quickly, in as few as ten to twenty-one days. An example of a specific trigger could be that any hurricane with one-minute maximum winds of ninety-six miles per hour or higher as it passes through a designated area would result in a payout.

Typical United States disaster recovery relies on federal funding from the Federal Emergency Management Agency (FEMA) and the National Flood Insurance Program (NFIP) to support disaster recovery. Limited dollars from federal disaster assistance creates a liquidity gap that could deepen the economic disruption following a disaster. If a catastrophic event occurs, the federal government does not have the authority to go beyond providing financial assistance to rebuild public facilities, small temporary housing allowances to families left homeless, and Small Business Administration loans to rebuild homes and businesses. Although some property losses will be covered by personal and private

[33] http://www.floods.org/
[34] https://www.planning.org/divisions/hazardmitigation/
[35] http://uvaw.uvlsrpc.org/
[36] http://uvaw.uvlsrpc.org/files/8814/2722/9426/UVAW_one_pager.pdf

insurance, the vast majority of losses will fall on the Territory, and thus, the taxpayers. The question is whether the Territory is prepared to absorb tens to hundreds of millions of dollars in damages and lost tax revenue. However, a parametric insurance transfer could move residual risk off the Territory's budget and onto the private sector.

Such a payment would not be subject to the limitations faced by federal disaster relief and could be used for any purpose, such as emergency response costs, replacing lost tax revenue, and funding of increased insurance costs. In 2014, a category five cyclone swept across the Pacific Island nation of Tonga, but because it had a parametric insurance program, the nation received an immediate payout of $1,270,000 towards disaster recovery.[37] In 2015, a category five cyclone swept across the Pacific Island nation of Vanuatu, but because of its participation in the World Bank-supported risk pooling facility, the Pacific Catastrophe Risk Assessment & Financing Initiative,[38] it was able to receive an insurance payout of $1,900,000 in less than 3 weeks.

The NFIP itself has purchased a risk transfer policy and is looking to expand this coverage through the NFIP 2016 Reinsurance Initiative,[39] which is intended "to more actively manage its financial risk... and diversify the tools it uses to manage the financial consequences of its catastrophic flood risk."

Case Study: Risk Transfer/Pooling, Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company (CCRIF SPC)[40]

In 2007, the Caribbean Catastrophe Risk Insurance Facility was formed as the first multi-country risk pool in the world, and was the first insurance instrument to successfully develop parametric policies backed by both traditional and capital markets. It was designed as a regional catastrophe fund for Caribbean governments to limit the financial impact of devastating hurricanes and earthquakes by quickly providing financial liquidity when a policy is triggered.

In 2014, the facility was restructured into a segregated portfolio company to facilitate expansion into new products and geographic areas and is now named CCRIF SPC. The new structure, in which products are offered through a number of segregated portfolios, allows for total segregation of risk. In April 2015, CCRIF signed an MOU with COSEFIN—the Council of Ministers of Finance of Central America, Panama and the Dominican Republic—to enable Central American countries to formally join the facility.

CCRIF offers earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments. CCRIF also helps to mitigate the short-term cash flow problems small developing economies suffer after major natural disasters. CCRIF's parametric insurance mechanism allows it to provide rapid payouts to help members finance their initial disaster response and maintain basic government functions after a catastrophic event.

Since the inception of CCRIF in 2007, the facility has made 22 payouts for hurricanes, earthquakes and excess rainfall to 10 member governments totaling approximately $69 million.

Sixteen Caribbean governments are currently members of the facility: Anguilla, Antigua & Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada,

[37] http://www.artemis.bm/blog/2014/01/24/pacific-catastrophe-risk-insurance-pilot-makes-first-payout/
[38] http://pcrafi.sopac.org/
[39] https://www.fema.gov/nfip-reinsurance-program
[40] http://www.ccrif.org/

Haiti, Jamaica, St. Kitts & Nevis, Saint Lucia, St. Vincent & the Grenadines, Trinidad & Tobago and Turks & Caicos Islands. Nicaragua is the first Central American government to become a CCRIF member.

In short, risk transfer strategies:

- Take the burden of risk off of the public sector;
- Provide resources to both repair physical damage and fill gaps in revenue streams, which ultimately slow down overall recovery; and,
- Provide additional economic options with respect to financial and insurance coverage, as well as disaster recovery

Such strategies highlight that proper planning, mitigation efforts, and climate adaptation actions, though important, can also be supported by financial and economic resilience strategies. As an island community the Virgin Islands recognizes the unique vulnerabilities of islands and the limitations of certain mitigation and adaptation options relative to continental settings. As offered by the Hawai'i resource team member, with respect to adaptation, mitigation, and response (and with the known effects to climate that are already guaranteed due to global greenhouse gas emissions):

- Some impacts are unavoidable and may not be effectively mitigated.
- Some impacts are unavoidable but can be mitigated by strategies and actions that compensate for, or offset, some of the adverse impacts.
- Some impacts are unavoidable but Hawai'i will adapt by changing our way of life, infrastructure, and economy to maintain a quality of life acceptable to Hawai'i residents.
- Some impacts may be avoidable if future greenhouse gas concentrations can be limited.

Lastly, "There are several 'no regrets' approaches in climate adaptation, employing strategies that serve to benefit communities regardless of the magnitude of future climate changes through hazard mitigation, resource conservation and economic efficiency simultaneously. Preparing for climate change largely entails better preparation for the natural hazards that already threaten our communities such as coastal erosion, flooding, hurricanes, and drought. A 'no regrets' approach may appeal to those who may not see the need to react to climate change due to the long-range projections of major impacts, but may see value in the same action to prepare and mitigate for existing natural hazards."[41]

3. Investigate other funding and capacity building opportunities

The workshop concluded with a discussion of funding and capacity issues for the Territory. While earlier recommendations have explored increasing human capacity and leveraging efforts across agencies, this recommendation is focused on funding and technical capacity.

3a. Addressing funding challenges

In response to the concerns around matching grants for the Territory, we discussed several federal funding sources that allow existing programs and budgets to serve as match funding. Taking the steps discussed earlier to align objectives across agencies will allow the Territory

[41] University of Hawai'i Sea Grant College Program. 2014. Climate Change Impacts in Hawai'i - A summary of climate change and its impacts to Hawai'i's ecosystems and communities, UNIHI-SEAGRANT-TT-12-04. http://seagrant.soest.hawaii.edu/sites/default/files/publications/smfinal-hawaiiclimatechange.pdf

to qualify for more funding opportunities. One example of this is the Community Development Block Grant program which is a source of grant funding that can be applied as a non-federal local match for FEMA hazard mitigation grant applications.

FEMA Hazard Mitigation planning grants support the development of Hazard Mitigation Plans and can include funding eligible activities such as supporting training and workshops to increase planning capacity and engagement through the process. As noted earlier, it is imperative that post-disaster funding, which can be substantial, should be assessed to include taking advantage of the post-disaster "window of opportunity" to inject risk reduction and adaptation measures into the recovery process.

Funding requests to increase resilience will be most successful if leveraging multiple funding streams and achieving risk reductions in multiple sectors. This is the financial corollary of recommendation 2c (Identify techniques to mutually advance multi-hazard mitigation and climate adaptation). Many federal agencies and territorial departments have funding streams that address a portion of the risk. Creating and adopting resilience principles creates a shared language across territorial departments, that will clarify the opportunities for leveraging funding streams to funding applications.

Other ideas from the workshop included Community Reinvestment Act funds, intended to help the credit needs of the communities in which they operate. Upon further research, this seems to be an option for the Virgin Islands.

A final concern discussed at the workshop was the structure of national philanthropic programs. Some foundations do not classify territories as part of their domestic programs and also do not quality as international. Organizing other territorial allies to approach these foundations could help bring attention to the gap in programming structures and might encourage them to adjust their practices to better serve the needs of the territories. Foundations should be made aware of the opportunity to work on specific issues that are extremely relatable to the rest of the U.S. where they are active. Specifically, the territories represent a smaller community eager to address issues of resilience.

In addition, not all foundations fail to recognize territories. As such, a concerted effort should be made to identify who likely funders are given the needs and strategic opportunities within the Territory and then meet with those funders to investigate their interest in investing in the Territory.

3b. Addressing capacity challenges

Another way to increase capacity is to take advantage of free training and tools. Two examples are below, one that is a tool for government, the other a tool for homeowners. Additionally, a summary of all tools referred to throughout this report can be found in the resources section at the end of the report.

Case Study: Center for Planning Excellence's Best Practices Manual for Development in Coastal Louisiana and Land Use Toolkits

The Center for Planning Excellence[42] is a non-profit organization that coordinates urban, rural, and regional planning in Louisiana. Founded in 2006, it has helped more than 30 cities, towns, and parishes with their planning efforts.

The Best Practices Manual for Development in Coastal Louisiana (Best Practices Manual)[43] emphasizes planning for resiliency. Invoking the destruction caused by Hurricane Katrina to

[42] http://www.cpex.org/
[43] http://www.cpex.org/best-practices-manual-coastal/

the Lower 9th Ward in New Orleans, the Best Practices Manual offers resilient design strategies to prevent such damage in the future. Funding for the manual came from the Coastal Protection and Restoration Authority and the National Association of Realtors, with support from local Realtor Boards.

The Best Practices Manual resulted from a recommendation in The Center for Planning Excellence's *Louisiana Speaks Regional Plan*[44] and *Louisiana's Comprehensive Master Plan for a Sustainable Coast.*[45] It is targeted at different types of users including local governments, state and federal agencies, tribal organizations, private real estate developers and builders, realtors, non-profit organizations, real estate professionals, insurance and financial services industries, as well as citizens living in the region.

The manual provides strategies and best practices that will work in any or all of the geotypes. Besides identifying the geotypes that a particular strategy will work in, the manual rates its level of urgency for implementation (essential, encouraged, or optional). It provides strategies on the community scale as well as at the site/building scale.

Case Study: Homeowner's Handbook to Prepare for Natural Hazards

In 2007 Dennis Hwang, Esq., and Darren K. Okimoto, PhD, of the University of Hawai'i Sea Grant College Program (Hawai'i Sea Grant) co-authored a community specific *Homeowner's Handbook to Prepare for Natural Hazards*.[46] The handbook targets the average homeowner and is based on three main principles: (1) make it easy to read and understandable to the average homeowner, with pictures and step-by-step instruction; (2) educate and inform the homeowner of hazard risk in their area, because homeowners will not act unless they believe there is a chance that a hazard can happen; and (3) offer as many options or solutions for the homeowner as possible that are relevant, reasonable and cost effective, even providing options the homeowner can do themselves after consulting with a licensed professional. Essentially, the Handbook does as much homework for the homeowner as possible.

The *Homeowner's Handbook to Prepare for Natural Hazards* provides useful tips regarding readiness for natural hazards that may affect Hawai'i, including tsunami and hurricanes. The handbook lists local emergency management agency information, as well as, emergency shelter and safe sites locations.

The Hawai'i publication is currently in its third edition with a little over 75,000 copies printed to date and distributed to Hawai'i residents and partners around the state. The handbook has been adapted by 7 other Sea Grant programs, providing assistance to homeowners in Alabama, Delaware, Florida, Louisiana, Massachusetts, Mississippi, and Texas (some state editions are also in multiple languages).

The success of the Handbooks are due in large part to the partnerships that help to create them including NOAA, state and local governments, emergency management agencies, non-governmental organizations, and private industry. A key partner has also been FEMA and its Building Science Branch, which has provided technical assistance for Hawai'i and other state Handbooks. All of the partners have been involved in updates ensuring reliability for the homeowners who use it.

In Hawai'i, creating the Handbook would not have been enough; it could only be successful

[44] http://www.cpex.org/louisiana-speaks/

[45] https://www.doi.gov/sites/doi.gov/files/migrated/deepwaterhorizon/adminrecord/upload/CPRA-Louisiana-s-Comprehensive-Master-Plan-for-a-Sustainable-Coast-2012.pdf

[46] http://seagrant.soest.hawaii.edu/?q=homeowners-handbook-prepare-natural-hazards

if homeowners know about it. The Handbook has been delivered to churches, neighborhood boards, senior groups, businesses, service clubs, building inspectors, insurance agents and many more. Recently, outreach has extended to emergency first responders. As a result of these outreach efforts, Hawai'i Sea Grant was awarded the 2013 Dr. Arthur Chiu Engineering Award by the Hawai'i State Civil Defense (now Hawai'i Emergency Management Agency) for its role in preparing the public. Then Vice Director of State Civil Defense stated that "the Handbook is by far their most popular handout," and that "it serves as an exemplary model of how to build community resilience.

The Handbook has just completed its first international version with the NOAA Coastal Storms Program and the College of the Marshall Islands for the Republic of the Marshall Islands (in both English and Marshallese).[47] Several other locations including Indiana, Illinois, New Jersey, Puerto Rico and the Republic of Palau are interested in developing their own versions of the Handbook, helping homeowners around the country and world stay as safe as possible.

4. Educate and engage the public: Integrate climate adaptation into preparedness efforts and health programming

4a. Build capacity on preparedness

Throughout the workshop, there was a strong interest in using health and disaster preparedness as a way to communicate and engage the public on climate issues.

Several programs were identified, including Health Care Without Harm and Community Emergency Response Teams, for collaboration on a training about climate change and preparedness. Additionally, climate change adaptation and sea level rise should be brought into the curriculum of all levels of education system (formal and informal social networks), as well as also youth programs, camps, etc to both reach the next generation and as another avenue for communicating with families.

Another way to increase capacity is through the NOAA Coastal Storms Program. The Mississippi / Alabama Sea Grant has helped communities analyze climate impacts, develop mitigation plans and incorporate sea-level rise into local hazard mitigation and comprehensive plans.[48]

Case Study: Coastal Community Resilience Index, Mississippi-Alabama Sea Grant Consortium (MS-AL SG)[49]

Gulf of Mexico coastal communities expressed the need for baseline data they could use to assess how they are progressing towards their goals to become more resilient. This self-assessment tool helps communities identify vulnerabilities, capitalize on strengths, and assess future impacts of natural disasters. It has been completed by nearly 50 communities across the Gulf of Mexico with more than 70 facilitators (including staff members from Texas Sea Grant, Louisiana Sea Grant, Mississippi-Alabama Sea Grant, and Florida Sea Grant) trained to deliver the tool and provide technical assistance to the communities in which they live and work.

The self-assessment brings together elected officials, public works directors, emergency managers, and other leaders at the community-government level (i.e., a Virgin Islands

[47] http://seagrant.soest.hawaii.edu/homeowners-handbook-prepare-natural-hazards-RMI
[48] http://masgc.org/projects/details/enhancing-mississippi-alabama-sea-grant-outreach-to-address-community-climate-adaptation-needs-in-mississippi-and-alabama
[49] http://masgc.org/coastal-storms-program/resilience-index

Climate Change Council) to take an in-depth look at their community's level of resilience. They discuss 57 indicators organized around six categories to identify vulnerabilities, capitalize on strengths and assess future impacts of disasters.

The Resilience Index focuses on the locations of critical infrastructure (is it in a special flood hazard area?), transportation issues (will bridges be out and for how long?), mitigation measures (are the most recent International Building Codes being used?), and community plans (does the comprehensive plan address disasters?). The Resilience Index also looks at how prepared community businesses are, such as grocery stores and fuel distributors, and the social systems, such as civic organizations and churches, that have a strong presence in the community.

MS-AL SG has also developed self-assessment indices for fisheries, tourism, and ports.[50]

Case Study: VCAPS: Vulnerability, Consequences, and Adaptation Planning Scenarios (North Carolina Sea Grant and South Carolina Sea Grant Consortium)[51]

VCAPS (Vulnerability, Consequences, and Adaptation Planning Scenarios) is a tool and process that supports planning by local decision makers concerned about coastal management and climate change vulnerability and adaptation. "The VCAPS process is intended to help communities become more resilient to weather and climate change.

During VCAPS, community members:

- Engage in dialogue about future weather and climate threats.
- Summarize and integrate local knowledge and experience about how the community will be impacted.
- Identify gaps in data, knowledge, or understanding.
- Think strategically about how to prevent harm by taking action in both the short and long term.

VCAPS builds on concepts of hazard management and vulnerability and uses participatory modeling techniques to organize and document dialogue and learning. Local knowledge and experience is integrated with scientific knowledge. The process is flexible and can be fine-tuned to the interests of participants."

4b. Standardize message on climate change and preparedness

Throughout the workshop, education and communication remained a theme. To reach the public, the Council and the Territory in general must utilize local ways of communication and meet communities where they are to explain their work. Additionally, there are significant opportunities to empower the community to facilitate their own discussions around climate and preparedness. There are several ways to tackle this recommendation.

First, there must be a consistent message coming from the Council and government. With programs and language consistent within government, information should flow from there to create talking points, consistent terminology, and a marketing campaign, among other materials. To accomplish this, the Council should also utilize the University, local primary schools, and/or private sector firms with strong relationships. The educational institutions could hold a competition/contest to create a mascot for climate efforts, and partners in the private sector may be able to contribute pro bono. We suggest that the Climate Council take advantage of the Sea Grant College Program's efforts to address this challenge, to include drawing on existing programs established by the North Carolina and Hawai'i Sea Grant

[50] http://masgc.org/coastal-storms-program/resilience-index
[51] http://vcapsforplanning.org/

programs, as well as, the ongoing research, education, and outreach conducted by Sea Grant faculty within the University of the Virgin Islands Marine Advisory Service (VIMAS).[52]

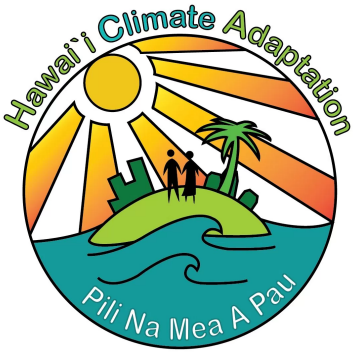
Case Study: Hawai'i Climate Adaptation Initiative Logo Designed by Students

In conjunction with the Hawai'i Climate Adaptation Initiative Act (Act 83, SLH 2014), the Department of Land and Natural Resources (DLNR), in partnership with the Interagency Climate Adaptation Committee (ICAC), teamed up with the Department of Education's Career and Technical Education (CTE) to have students participating in their Graphic Design Program create a logo for the Hawai'i Climate Adaptation Initiative. The DLNR participated in the CTE's 2016 Student Performance Based Assessments (PBA) held over multiple weeks on different islands. The students were asked to design a creative, innovative, and professional logo that expresses the student's perspective on climate adaptation and how it relates to the State of Hawai'i.

Students were given approximately 12 hours to design a logo(s) and prepare a presentation to be presented the next day to a panel of judges. In preparation for the PBA, the students were also required to write a short paper on Climate Adaptation. All logos created at the PBA were given to the DLNR to review and the top five logos were presented to the ICAC at the following regularly scheduled meeting, where a winner was selected.

The inspiration for the winning design came from:

- The ocean and waves surrounding the small island represents the problem of sea level rise;
- The sun with its beaming rays represents temperatures rising, which also contributes to rising sea levels;
- As the saying "Pili Na Mea A Pau" means "all things are related" the logo is meant to show how the sun, the island (representing the Hawaiian islands) with its people, and the ocean are connected;
- The use of green and blue for "Hawai'i Climate Adaptation" is purposeful as Hawai'i is known for its green mountains (landscape) and blue ocean.



The logo is featured on the Climate Adaptation Portal,[53] social media platforms, and other official government documents (stationary, pamphlets, etc.).

4c. Utilize and expand VICCA.info

The Council has already created VICCA.info website to engage the public. This resource can reach a variety of audiences, and should explain the goals, benefits, and costs of various resilience standards for individual property owners and communities, as well as the initiatives of the territory.

The website should be a portal to both educate the public as well as be a resource to those who need more information.

Case Study: Ohio State Hazard Analysis Resource and Planning Portal[54]

[52] Virgin Islands Marine Advisory Service (http://www.uvi.edu/community/virgin-islands-marine-advisory-service/) at the University of the Virgin Islands is additionally supported by Puerto Rico Sea Grant (http://seagrantpr.org/)
[53] http://climateadaptation.hawaii.gov/

SHARPP, administered by the Ohio Emergency Management Agency's (EMA) Mitigation Branch, is a repository for state and local hazard mitigation plans and also serves as the state Emergency Management Agency's main medium for distributing information on mitigation planning, mitigation projects, and general mitigation resources.

Ohio EMA officials cite the public outreach aspects of SHARPP as one of its benefits. The tool helps the public as well as local officials understand the need for mitigation and adaptation. SHARPP allows the public to be more informed about the natural hazard risks facing their communities as well as the actions these communities plan to address them. It allows citizens to see the projects occurring in their own communities.

It offers three tiers of access: Tier 1 is for the general public, allowing view-only access and the ability to create basic data reports; Tier 2 is for County EMA Directors, local project managers, and various state agencies; Tier 3 is accessible only to Ohio EMA Administrators.

Case Study: Massachusetts StormSmart Coasts Program[55]

The MA Office of Coastal Zone Management (CZM) developed this program as a central location for tools, information, and strategies to help communities plan for coastal erosion, flooding, and climate change threats. It offers general educational resources as well as detailed technical assistance on local resilience planning and model pilot projects for implementation. CZM also administers the related Coastal Community Resilience Grant Program, a competitive grant to assist communities looking to adopt these innovative resilience strategies.

[54] https://ohiosharpp.ema.state.oh.us/ohiosharpp/
[55] http://www.mass.gov/eea/agencies/czm/program-areas/stormsmart-coasts

Conclusion

The workshop was successful in identifying opportunities, specifically within the Hazard Mitigation Planning process, to strengthen the ability of the Virgin Islands and its agencies to adapt to a changing climate. This report has attempted to lay out a series of actions focused on aligning mitigation activities across agencies, developing criteria to evaluate how future projects increase resilience and avoid investments in high risk locations, and educating the public on risk reduction strategies.

The Governors' Institute encourages Governor Mapp and the Climate Change Council to use these recommendations as a guide in taking specific steps towards a more resilient Territory. Many of them can be begun or started in the short-term, while others are longer-term initiatives.

The Territory has taken an important first strep in establishing the Climate Change Council, but without the participation of all Council members, key stakeholders, and the public, it will be challenging for the Territory to holistically plan for and build resilience to climate change. Commitment to this initiative is critical for productive conversations and collective agreement prior to action.

The Governors' Institute on Community Design is available to support the Virgin Islands in their work moving these recommendations into action.

Resources

Tools & Guides

NOAA Digital Coast
https://coast.noaa.gov/digitalcoast/

Homeowner's Handbook (Hawai'i Sea Grant):
http://seagrant.noaa.gov/WhatWeDo/ResilienceToolkit/BrowseToolkit/TabId/618/ArtMID/5569/ArticleID/459/Homeowners-Handbooks.aspx

Role of States in Disaster Recovery Video and Accompanying Training Guide:
http://coastalresiliencecenter.unc.edu/crc-projects/the-role-of-states-in-disaster-recovery/
http://coastalresiliencecenter.unc.edu/wp-content/uploads/2016/04/Role_of_States_Training_Guide.pdf

Boston Green Building and Climate Resiliency Guidelines:
http://www.bostonplans.org/planning/planning-initiatives/article-37-green-building-guidelines

Post-Disaster Rebuilding Guidelines and Protocols, County of Maui, Hawai'i:
http://files.hawaii.gov/dbedt/op/czm/ormp/working_group/meeting_presentations/wg_presentation_20150604_mauipostdisaster.pdf

Florida Post Disaster Redevelopment Planning & Toolbox
http://www.floridadisaster.org/Recovery/IndividualAssistance/pdredevelopmentplan/

Center for Planning Excellence's Best Practices Manual for Development in Coastal Louisiana and Land Use Toolkits: http://www.cpex.org/best-practices-manual-coastal/

Coastal Community Resilience Index (MS-AL Sea Grant Consortium):
http://seagrant.noaa.gov/WhatWeDo/ResilienceToolkit/BrowseToolkit/TabId/618/ArtMID/5569/ArticleID/333/Coastal-Community-Resilience-Index.aspx

Vulnerability, Consequences, and Adaptation Planning Scenarios (NC/SC Sea Grant):
http://seagrant.noaa.gov/WhatWeDo/ResilienceToolkit/BrowseToolkit/TabId/618/ArtMID/5569/ArticleID/428/Vulnerability-Consequences-and-Adaptation-Planning-Scenarios-VCAPS.aspx

Highways in the Coastal Environment: Assessing Extreme Events
Guidance and methods for assessing the vulnerability of coastal transportation facilities to extreme events and climate change.
https://www.fhwa.dot.gov/engineering/hydraulics/pubs/nhi14006/nhi14006.pdf

Academic Resources

Godschalk, David. 2009. APA. Safe Growth Audit.
https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/zoningpractice/open/pdf/oct09.pdf

Glavovic, Bruce and Smith, Gavin. 2014. Adapting to Climate Change: Lessons from Natural Hazards Planning. New York: Springer.

Smith, Gavin. 2011. Planning for Post-Disaster Recovery: A Review of the United States Disaster Assistance Framework. Washington, D.C.: Island Press.

Smith, Gavin, Amanda Martin and Dennis Wenger. “Disaster Recovery in an Era of Climate Change: The Unrealized Promise of Institutional Resilience.” In Handbook of Disaster Research, Second Edition, Eds. Havidan Rodriguez, Joseph Trainor and William Donner. New York: Springer (under development).

Smith, Gavin, Dylan Sandler, Mikey Goralnik. October 2013. Vermont State Agency Policy Options. Smart Growth Implementation Assistance Program: Disaster Recovery and Long-Term Resilience Planning in Vermont. Chapel Hill, North Carolina: Department of Homeland Security Coastal Hazards Center of Excellence.

Smith, Gavin and Dylan Sandler. July 2012. State Disaster Recovery Guide. Chapel Hill, North Carolina: Department of Homeland Security Coastal Hazards Center of Excellence.

Woodruff, Sierra C. and Stults, Missy. May 2016. Nature Climate Change. Numerous strategies but limited implementation guidance in US local adaptation plans. http://www.nature.com/nclimate/journal/v6/n8/full/nclimate3012.html

State and Community Programs

Colorado Resiliency & Recovery Office and Colorado Resiliency Framework: https://drive.google.com/open?id=0B_gHrzLAL2NTb3BiVFBaVkQtOFU

Baltimore Disaster Preparedness and Planning Project Plan: http://www.baltimoresustainability.org/plans/disaster-preparedness-plan/

Charlotte-Mecklenburg, NC Floodplain Buyout Program http://charlottenc.gov/StormWater/Flooding/Pages/FloodplainBuyoutProgram.aspx

Seattle Neighborhoods Actively Prepare https://www.seattle.gov/emergency-management/working-together/seattle-neighborhoods-actively-prepare

Other Resources

Risk Transfer/Pooling, Caribbean Catastrophe Risk Insurance Facility Segregated Portfolio Company: http://www.ccrif.org/

Appendix A

Worksheet shared at workshop: FEMA checklist used to evaluate state and territorial hazard mitigation plans with various ways to integrate climate change within FEMA guidance.

B.2 Standard State Mitigation Plan Regulation Checklist

*M = Met; NM = Not Met	Location in Plan	M / NM*
STANDARD (S) STATE MITIGATION PLAN		
Planning Process		
S1. Does the plan describe the planning process used to develop the plan? [44 CFR §§201.4(b) and (c)(1)]		
Optional Climate Addition: Climate-related stakeholders were included in the planning process (e.g., local climate action committees, climate scientists, climate-related environmental organizations).		
Optional Climate Addition: Climate change was discussed during public meetings (e.g., slides about climate change were delivered at public meetings; hand outs about climate change were available; climate knowledgeable stakeholders were at public meetings to answer questions).		
Optional Climate Addition: Information from existing regional, local, and territory specific climate plans or reports are integrated into the planning process and into the final HMP.		
Optional Climate Addition: The planning process, and the final HMP include details for how new climate-related information, as its developed or monitored, will be integrated into future plans, actions, and implementation strategies.		
Required Revisions:		
Hazard Identification and Risk Assessment		
S3. Does the risk assessment include an overview of the type and location of all natural hazards that can affect the state? [44 CFR §§201.4(c)(2)(i)]		
Optional Climate Addition: General discussion within the hazards section about how climate change is already and could continue to affect the intensity, frequency, and return period of natural disasters. This includes the possibility of new hazards occurring which have not previously been experienced, due to climate change.		
Optional Climate Addition: Climate change considered as a stand-alone hazard that is evaluated within the hazard identification and risk assessment portion of the HMP.		
Optional Climate Addition: Discussion of how climate change could affect each hazard in the jurisdiction (e.g., not basing decisions on historical hazards but also considering how climate change could impact the frequency, intensity, or duration of natural hazards in the future). This would ensure that climate change is a fundamental factor considered during the risk assessment.		
S4. Does the risk assessment provide an overview of the probabilities of future hazard events? [44 CFR §§201.4(c)(2)(i)]		
Optional Climate Addition: Future probabilities are calculated using future climate change projections, meaning that the past is not used as an analogue for the future.		
S5. Does the risk assessment address the vulnerability of state assets located in hazard areas and estimate the potential dollar losses to these assets? [44 CFR §§201.4(c)(2)(ii) and 201.4(c)(2)(iii)]		
Optional Climate Addition: All risk assessments include the risk to assets based on projected changes in future climate (not just historic risk). This means that both the likelihood of an impact as well as the consequence (the two elements of a risk assessment) are adjusted based on projected changes in climate.		
S6. Does the risk assessment include an overview and analysis of the vulnerability of jurisdictions to the identified hazards and the potential losses to vulnerable structures? [44 CFR §§201.4(c)(2)(i) and 201.4(c)(2)(iii)]		
Optional Climate Addition: Projected changes in future climate are integrated into the vulnerability assessment (e.g., exposure elements are updated and that translates into climate-related assessments of sensitivity and adaptive capacity), thereby ensuring that future vulnerability and risk is integrating climate change.		

S7. Was the risk assessment revised to reflect changes in development? [44 CFR §§201.4(d)]		
Optional Climate Addition: The previous risk assessment is updated based on development patters as well as historical changes in weather/climate that have already shifted the risk profile for the jurisdiction.		
Optional Climate Addition: All future flood risks are calculated based on climate change projections and focus on the 500 year flood – not the 100 year flood.		
Required Revisions:		
Mitigation Strategy and Priorities		
S8. Does the mitigation strategy include goals to reduce / avoid long-term vulnerabilities from the identified hazards? [44 CFR §§201.4(c)(3)(i)]		
Optional Climate Addition: All goals should integrate climate change projections so that vulnerabilities to historic as well as future hazards are being reduced.		
Optional Climate Addition: The HMP explicitly mentions a strategy for integrating climate-related priorities into other jurisdictional plans, programs, or policies, thereby ensuring climate change is mainstreamed throughout.		
S9. Does the plan prioritize mitigation actions to reduce vulnerabilities identified in the risk assessment? [44 CFR §§201.4(c)(3)(iii) and (iv)]		
Optional Climate Addition: Proposed mitigation actions need to be viable in a climate-altered future, meaning that climate change needs to be factored into the process of identifying appropriate hazard mitigation actions.		
Optional Climate Addition: Climate change related criteria are included in the overall evaluation criteria used to evaluate all proposed mitigation strategies/actions.		
S10. Does the plan identify current and potential sources of funding to implement mitigation actions and activities? [44 CFR §§201.4(c)(3)(iv)]		
Optional Climate Addition: Programs related to climate change that are already in existence or that are prioritized in other jurisdictional plans are identified and leveraged in the HMP.		
S11. Was the plan updated to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities? [44 CFR §§201.4(d)]		
Optional Climate Addition: Climate change considered as a stand alone hazard that is evaluated within the plan.		
Required Revisions:		
State Mitigation Capabilities		
S12. Does the plan discuss the evaluation of the state's hazard management policies, programs, capabilities, and funding sources to mitigate the hazards identified in the risk assessment? [44 CFR §§201.4(c)(3)(ii)]		
Optional Climate Addition: Climate change related criteria are explicitly used as part of the evaluation process. Wherever possible, the reduction of future risk (by incorporating climate considerations into decision-making, planning, and policy development) is used to evaluate the success of the HMP and the associated actions.		
Required Revisions:		

*M = Met; NM = Not Met	Location in Plan	M / NM*
Local Coordination and Mitigation Capabilities		
S13. Does the plan generally describe and analyze the effectiveness of local and tribal, as applicable, mitigation policies, programs, and capabilities? [44 CFR §§201.4(c)(3)(ii)]		
Optional Climate Addition: Climate change related action at local, tribal, or regional scales are described, analyzed, and built-upon throughout the HMP.		
S14. Does the plan describe the process to support the development of approvable local and tribal, as applicable, mitigation plans? [44 CFR §§201.3(c)(5) and 201.4(c)(4)(i)]		
Optional Climate Addition: The plan clearly outlines how climate change related information, tools, resources or programs would be shared with and/or developed to support local, tribal, and regional mitigation plans that are prepared for historic as well as future hazard events.		
S15. Does the plan describe the criteria for prioritizing funding? [44 CFR §§201.4(c)(4)(iii)]		
Optional Climate Addition: Climate change related criteria are used as elements to evaluate and prioritize funding allocations.		
S16. Does the plan describe the process and timeframe to review, coordinate and link local and tribal, as applicable, mitigation plans with the state mitigation plan? [44 CFR §§201.3(c)(6), 201.4(c)(2)(ii), 201.4(c)(3)(iii), and 201.4(c)(4)(ii)]		
Optional Climate Addition: This process ensures that local, tribal, and regional stakeholders who have integrated climate change into their HMP are given an opportunity to share their process and successes with each other and the state.		
Optional Climate Addition: The state, through the planning process and the HMP, encourages multi-jurisdictional coordination on climate-related issues.		
Required Revisions:		
Plan Review, Evaluation, and Implementation		
S17. Is there a description of the method and schedule for keeping the plan current? [44 CFR §§201.4(c)(5)(i) and 201.4(d)]		
Optional Climate Addition: A process is clearly outlined for how new climate-related information will be integrated into HMP updates, program updates, or policy revisions.		
S18. Does the plan describe the systems for monitoring implementation and reviewing progress? [44 CFR §§201.4(c)(5)(ii) and 201.4(c)(5)(iii)]		
Optional Climate Addition: An adaptive management process is outlined so that new information (climate data, insight into the effectiveness of actions, etc.) is integrated into HMP programs, initiatives, or policies.		
Required Revisions:		
Adoption and Assurances		
S19. Did the state provide documentation that the plan has been formally adopted? [44 CFR §§201.4(c)(6)]		
Optional Climate Addition: Climate-related stakeholders openly support the plan.		
S20. Did the state provide assurances? [44 CFR §§201.4(c)(7)]		
Required Revisions:		

HAZARD MITIGATION PLAN REVIEW TOOL TEMPLATE	BASED ON FEMA	
Repetitive Loss (RL) Strategy		
RL1. Did Element S6 (risk assessment) address RL and SRL properties? [44 CFR §§201.4(c)(2)(ii), 201.4(c)(2)(iii), and 201.4(c)(3)(v)]		
Optional Climate Addition: This element of the plan also looks at how the frequency of RL and SRL properties could change given projected changes in climate.		
RL2. Did Element S8 (mitigation goals) address RL and SRL properties? [44 CFR §§201.4(c)(3)(i) and 201.4(c)(3)(v)]		
Optional Climate Addition: Goals are set to avoid future RL and SRL damages by determining where current and future risk, based on climate change projections, may exist.		
RL3. Did Element S9 (mitigation actions) address RL and SRL properties? [44 CFR §§201.4(c)(3)(iii) and 201.4(c)(3)(v)]		
Optional Climate Addition: Actions are selected to mitigate risk to current and future RL and SRL properties by ensuring that climate change projections are used to estimate future risk.		
RL4. Did Element S10 (funding sources) address RL and SRL properties? [44 CFR §§201.4(c)(3)(iv) and 201.4(c)(3)(v)]		
Optional Climate Addition: Funding sources are identified to adequately deal with current and future RL and SRL properties, based on future projections of climate change and climate risk.		
RL5. Did Element S13 (local and tribal, as applicable, capabilities) address RL and SRL properties? [44 CFR §§201.4(c)(3)(ii) and 201.4(c)(3)(v)]		
Optional Climate Addition: Local, tribal, and regional HMP's and appropriate activities address identifying existing as well as future projected RL and SRL properties based on the best available climate-related information. Moreover, these plans and programs adequately identify appropriate risk mitigation actions to deal with existing and future climate-related risks.		
RL6. Did Element S15 (prioritizing funding) address RL and SRL properties? [44 CFR §§201.4(c)(4)(iii) and 201.4(c)(3)(v)]		
Optional Climate Addition: Funding is prioritized to current address RL and SRL properties and to avoid future RL and SRL properties by taking actions that will reduce future risk based on climate-related projections.		
Required Revisions:		

B. 3 Enhanced State Mitigation Plan Regulation Checklist

*M = Met; NM = Not Met	Location in Plan	M / NM*
ENHANCED (E) STATE MITIGATION PLAN		
Meet Standard State Mitigation Plan Elements		
E1. Does the Enhanced plan include all elements of the standard state mitigation plan? [44 CFR §§201.5(b)]		
Required Revisions:		
Integrated Planning		
E2. Does the plan demonstrate integration to the extent practicable with other state and/or regional planning initiatives and FEMA mitigation programs and initiatives? [44 CFR §§201.5(b)(1)]		
Optional Climate Addition: Climate-related plans, programs, and initiatives are integrated into the HMP and efforts are made to tie results from the HMP into other climate-related plans and programs.		

Required Revisions:		
State Mitigation Capabilities		
E3. Does the state demonstrate commitment to a comprehensive mitigation program? [44 CFR §§201.5(b)(4)]		
Optional Climate Addition: A plan exists for how climate change will be integrated into all elements of the jurisdiction's operations.		
E4. Does the enhanced plan document capability to implement mitigation actions? [44 CFR §§201.5(b)(2)(i), 201.5(b)(2)(ii), and 201.5(b)(2)(iv)]		
Optional Climate Addition: Implementation responsibilities are clearly assigned and, where relevant, climate-related stakeholders are tasked with implementing key plan provisions.		
E5. Is the state effectively using existing mitigation programs to achieve mitigation goals? [44 CFR §§201.5(b)(3)]		
Optional Climate Addition: Climate-related programs, plans, policies, or constituencies are leveraged and mobilized to help implement and build the resilience of the jurisdiction.		
Required Revisions:		
HMA Grants Management Performance		
E6. With regard to HMA, is the state maintaining the capability to meet application timeframes and submitting complete project applications? [44 CFR §§201.5(b)(2)(iii)(A)]		
E7. With regard to HMA, is the state maintaining the capability to prepare and submit accurate environmental reviews and benefit-cost analyses? [44 CFR §§201.5(b)(2)(iii)(B)]		
Optional Climate Addition: Climate change considerations are integrated into environmental reviews and benefit-cost analyses.		
E8. With regard to HMA, is the state maintaining the capability to submit complete and accurate quarterly progress and financial reports on time? [44 CFR §§201.5(b)(2)(iii)(C)]		
E9. With regard to HMA, is the state maintaining the capability to complete HMA projects within established performance periods, including financial reconciliation? [44 CFR §§201.5(b)(2)(iii)(D)]		
Optional Climate Addition: The jurisdiction is monitoring the effectiveness of proposed actions based on alleviating current as well as future risks and vulnerabilities.		
Required Revisions:		