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University of Hawai'i Sea Grant College Program

Center for Island Climate Adaptation and Policy

Executive Summary and Action Matrix From

Sea-Level Rise and Coastal Land Use in Hawai'i: A Policy Tool Kit for State and Local Governments

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ICAP

CENTER FOR ISLAND CLIMATE ADAPTATION AND POLICY

The Center for Island Climate Adaptation and Policy ("ICAP") facilitates a sustainable, climate-conscious future for Hawai'i, the Pacific, and global island communities. ICAP produces innovative, interdisciplinary research and real-world solutions for island decision-makers in the public and private sectors. As a focal point for University of Hawai'i climate expertise, the Center serves as a two-way conduit between the University and island communities to catalyze climate change adaptation and resiliency. ICAP is a University of Hawai'i Sea Grant Center of Excellence in partnership with the University of Hawai'i William S. Richardson School of Law, the School of Ocean and Earth Science and Technology, the Hawai'inuiākea School of Hawaiian Knowledge, and the College of Arts and Sciences. Additional information about ICAP is available at http://www.islandclimate.org.

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The University of Hawai'i Sea Grant College Program has served Hawai'i and the Pacific for over 40 years and is dedicated to achieving resilient coastal communities characterized by vibrant economies, social and cultural sustainability and environmental soundness.

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Executive Summary

Rising sea levels along Hawai‘i’s shorelines call for state and local governments to take action by means of a wide range of coastal land use policy tools designed to help Hawai‘i successfully adapt to climate change. Hawai‘i is expected to experience sea-level rise of one foot by 2050 and three feet by the end of the century. Sea-level rise of this magnitude poses significant economic, social, and environmental challenges requiring leadership and bold action by state and local governments, which are uniquely positioned to implement land use policy tools to shape Hawai‘i’s efforts to successfully adapt to rising sea levels in the coming decades.

The purpose of this Tool Kit is to identify and explain key land use policy tools for state and local government agencies and officials to facilitate leadership and action in support of sea-level rise adaptation in Hawai‘i. Across the United States and around the world, governments are developing policy tools to proactively adapt to threats from rising sea levels. For example, the U.S. Army Corps of Engineers now requires consideration of sea-level rise impacts to coastal and estuarine zones in all phases of its civil works programs. In addition to incorporating projected sea-level rise in land use decision-making, experts also recommend that governments locate coastal development where it is protected from hazards, and ensure structures are resilient to flooding and other coastal hazards exacerbated by sea-level rise.

Accordingly, this Tool Kit surveys state adaptation plans, federal efforts, and other key sources to identify and discuss important land use policy tools for Hawai‘i and suggests how these policies can be used by state and local governments to avoid or lessen the impacts of sea-level rise and related coastal hazards. Adaptation planning for sea-level rise and climate change is necessary to protect public health and safety, both now and in the future, and it is widely acknowledged that proactive planning can be more effective and less costly than responding reactively to climate change impacts as they occur. Because sea-level rise and climate change exacerbate existing coastal hazards, adapting now ultimately will lessen future economic, social, and environmental impacts of rising sea levels.

This Tool Kit first reviews scientific research showing that climate change is causing sea-level rise in the Hawaiian Islands and around the world. The physical and environmental impacts of rising sea levels – including coastal erosion, flooding, wave inundation, and rising water tables – are chronicled, as well as the economic and social impacts. The necessity for “adaptive management” in the face of uncertainty is noted, as is the important role to be played by state and local governments in implementing adaptation measures.

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The Tool Kit next proposes three major actions that state and local governments should consider to move Hawai‘i forward in its efforts to successfully adapt to sea-level rise:

- The governor or state legislature should direct state agencies to incorporate a sea-level rise benchmark of 1-foot-by-2050 and 3-feet-by-2100 in planning and permitting processes and decision-making, similar to the approach taken by the U.S. Army Corps of Engineers and to an executive order issued in California.

- Scientific research must be expanded. Policy tools addressing sea-level rise derive legitimacy from the strength of the supporting science. Funding and support for continued scientific research, ultimately to establish site-specific estimates of sea-level rise impacts, is imperative.

- A lead agency or task force, charged with initiating statewide adaptation planning to facilitate coordination and collaboration among various agencies and stakeholders, should be established. This entity will increase access to information, promote consistency among adaptation planning efforts, and create the statewide vision that is crucial to successful sea-level rise adaptation.

The Tool Kit also identifies and discusses specific land use policy tools Hawai‘i state and local governments should consider in efforts to address sea-level rise. These policy tools are presented in four main categories: planning tools, regulatory tools, spending tools, and market-based tools.

- Planning tools include the Hawaii Coastal Zone Management Act, comprehensive plans, and pre-disaster mitigation plans.

- Regulatory tools include zoning and overlay zones, floodplain regulations, shoreline construction setbacks, coastal construction control lines, hard armoring, rebuilding restrictions, building codes and resilient design, subdivision approvals, cluster development, land development conditions, environmental review, rolling easement statutes, non-structural armoring, and buffer zones.

- Spending tools include capital improvement programs, land acquisitions, conservation easements, and rolling conservation easements.

- Market-based tools include mandatory real estate disclosures, tax incentives, and transfer of development rights programs.

Finally, to encourage action and make the Tool Kit ready for use by state and local governments, an action matrix is included as an appendix. The action matrix is organized according to the three major approaches to sea-level rise: accommodation, protection, and retreat. In addition to summarizing the policy tools and initial steps for accommodation, protection, and retreat, each action matrix identifies the lead agency and proposes a time frame for specific state and local government actions. The tools are ranked based on impact and feasibility, with the highest ranking policy tools discussed first.

APPENDIX A: ACTION MATRIX

To facilitate action, this Appendix provides an action matrix for each of the three major approaches to sea-level rise adaptation: accommodation, protection and retreat. The "Policy Tool" column ranks each tool based on impact and feasibility, with the highest ranking tools first. The middle columns identify "Initial Steps" and "Lead Agencies." The "Time Frame" column estimates the implementation time period for each policy tool. "Immediate" means 1 year, "Near-Term" means 1 to 2 years, and "Longer-Term" means 2 to 4 years.

Appendix A-1: Action Matrix – Accommodation

Policy Tool Ranking	*Initial Steps*	*Lead Agency*	*Time Frame*
Pre-Disaster Mitigation Plans	• Upon completion of SLR risk and vulnerabilities assessments, seek FEMA funding to develop PDM projects for areas and infrastructure particularly vulnerable to amplified impacts. • Consider a 1-foot-by-2050 and 3-feet-by-2100 SLR benchmark when updating and developing PDM plans and projects.	State and county civil defense agencies	• Immediate • Near-Term
Zoning and Overlay Zones	Develop recommendations for establishing accommodation overlay zones in which local governments will limit the intensity and density of new development and require retrofitting new structures to be more resilient to inundation.	Adaptation Task Force or Lead Agency (as proposed in this Tool Kit)	Longer-Term
Floodplain Regulations	• Utilize best-available SLR and coastal hazard data to extend NFIP regulations beyond the historic 100-year floodplain. • Research opportunities for participating in the FEMA CRS program to qualify affected homeowners for discounts on flood insurance.	County councils	Near-Term
Building Codes	Require amendments to state and county building codes that consider a 1-foot-by-2050 and 3-feet by-2100 SLR benchmark.	Hawai'i Legislature	Near-Term
NFIP Resilient Design Requirements	• Increase NFIP elevation requirements and apply requirements to areas beyond the 100-year floodplain. • Research opportunities for participating in the FEMA CRS program to qualify affected homeowners for discounts on flood insurance.	County councils	Near-Term
Land Development Conditions – Subdivisions	Develop recommendations for amending HRS ch. 46 to require counties to adopt ordinances that impose development conditions upon subdivisions that mitigate the impacts of a 1-foot-by-2050 and 3-feet by-2100 SLR benchmark.	ICAP	Near-Term
Land Development Conditions –SMA Permits	Under the authority of HRS § 205A-26, impose development conditions upon SMA permits that minimize the impacts of exacerbated flooding, storm surge, and erosion due to SLR.	County permitting authorities	Immediate
Environmental Review	Amend HRS ch. 343 and applicable administrative rules to explicitly incorporate review of SLR and climate change impacts of a proposed action or development project.	Hawai'i Legislature	Immediate
Capital Improvement Programs	Require consideration of multiple scenarios of SLR when developing and approving CIPs.	Executive Order	Immediate
Tax Incentives	Develop tax incentive program for developers and property owners who retrofit structures to be more resilient to SLR impacts than state and county building codes and floodplain regulations require.	State of Hawai'i Department of Taxation	Longer-Term

Appendix A-2: Action Matrix – Protection

Policy Tool Ranking	*Initial Steps*	*Lead Agency*	*Time Frame*
Zoning and Overlay Zones	Develop recommendations for establishing protection overlay zones in areas containing critical infrastructure and dense urban development where local governments will permit coastal armoring and require beach non-structural armoring where feasible.	Adaptation Task Force or Lead Agency (as proposed in this Tool Kit)	Longer-Term
Hard Armoring	• Identify critical infrastructure or areas where hard armoring will be permitted. • Impose conditions that limit future repairs, rebuilding, and strengthening when granting variances for hard armoring structures.	• Adaptation Task Force or Lead Agency (as proposed in this Tool Kit) • County permitting authorities	• Longer-Term • Immediate
Non-Structural Armoring	Identify areas where non-structural armoring will be permitted.	DLNR Office of Conservation and Coastal Lands	Immediate
Capital Improvement Programs	Require consideration of multiple scenarios of SLR when developing and approving capital improvement programs.	Executive Order	Immediate

Appendix A-3: Action Matrix – Retreat

Policy Tool Ranking	*Initial Steps*	*Lead Agency*	*Time Frame*
Hawaii Coastal Zone Management Act	• Utilize existing objectives and policies for reducing threats from coastal hazards to implement SLR retreat measures in the SMA. • Develop recommendations for establishing SLR retreat policies and objectives.	• County councils and permitting authorities • ORMP Policy/Working Group, UH Sea Grant, ICAP	• Immediate • Near-Term
Comprehensive Plans	• Utilize existing state objectives and policies for sustainability and reducing threats from coastal hazards to accommodate a 1-foot-by-2050 and 3-feet-by-2100 SLR benchmark in state and county plans and programs. • Amend State Plan and county plans to encourage retreat in areas vulnerable to SLR.	• State and county planning departments and agencies • Hawai‘i Legislature and county planning departments	• Immediate • Near-Term
Pre-Disaster Mitigation Plans	• Upon completion of SLR risk and vulnerabilities assessments, seek FEMA funding to develop PDM projects for areas and infrastructure particularly vulnerable to amplified impacts. • Consider a 1-foot-by-2050 and 3-feet-by-2100 SLR benchmark when updating and developing PDM plans and projects.	State and county civil defense agencies	• Immediate • Near-Term
Zoning and Overlay Zones	Establish retreat zones that prohibit shoreline armoring and encourage property owners to relocate structures upland through tax incentives, acquisition, or conservation easement programs.	Adaptation Task Force or Lead Agency (as proposed in this Tool Kit)	Longer-Term
Floodplain Regulations	• Impose more stringent use restrictions in flood-prone areas. • Research opportunities for participating in the FEMA CRS program to qualify affected homeowners for discounts on flood insurance.	County councils	Near-Term
Shoreline Construction Setbacks	• Remove state maximum 40-foot setback to account for structures located in state conservation district. • Implement erosion-based setbacks that account for the lifespan of structures for each county, where appropriate, and allow for adjustments based upon best-available SLR data.	• Hawai‘i Legislature • County councils	Immediate

Policy Tool Ranking	*Initial Steps*	*Lead Agency*	*Time Frame*
Coastal Construction Control Line	• Analyze CCCL concept within Hawai'i legal framework. • Identify research needs for implementing CCCLs and areas where CCCLs would be appropriate.	• ICAP • UH Sea Grant/DLNR Office of Conservation and Coastal Lands	Near-Term
Rebuilding Restrictions	Strengthen rebuilding restrictions for nonconforming structures.	County councils	Immediate
Subdivision Approvals	Utilize available data to protect public health and safety by restricting residential subdivisions in areas prone to current and future coastal hazards such as subsidence, erosion, storm surge, and SLR.	County planning and permitting authorities	Near-Term
Cluster Development	Adopt cluster development ordinances that restrict development in low-lying areas or in areas containing natural flood buffers. Clustering could be mandatory or incentivized.	County councils	Near-Term
Environmental Review	Amend HRS ch. 343 and applicable administrative rules to explicitly incorporate review of SLR and climate change impacts of a proposed action or development project.	Hawai'i Legislature	Immediate
Rolling Easement Statutes	Develop rolling easement policy to incorporate into State Plan or HCZMA that establishes SLR retreat goals.	UH Sea Grant, ICAP	Near-Term
Buffer Zones	Identify and map natural inundation buffers (e.g., sand dunes and wetlands) requiring protection and establish mandatory buffer distances.	DLNR Office of Conservation and Coastal Lands, UH Sea Grant, Adaptation Task Force or Lead Agency (as proposed in this Tool Kit)	Near-Term
Capital Improvement Programs	Require consideration of multiple scenarios of SLR when developing and approving capital improvement programs.	Executive Order	Immediate
Land Acquisitions	Amend Hawai'i Legacy Land Conservation Program to prioritize land threatened by SLR inundation, erosion, and other coastal hazards with the purpose of protecting public health and safety.	Hawai'i Legislature	Longer-Term
Conservation Easements	Amend HRS ch. 198 to authorize non-profit organizations to hold conservation easements for the purpose of protecting life and property from coastal hazards and inundation due to climate change and SLR.	Hawai'i Legislature	Longer-Term
Rolling Conservation Easements	Analyze rolling conservation easement concept within Hawai'i legal framework.	ICAP	Immediate
Mandatory Real Estate Disclosures	• Require disclosure of erosion rates for coastal properties. • Upon completion of SLR risk and vulnerability assessments, require disclosure of such information for properties located in coastal high hazard areas.	Hawai'i Legislature	• Immediate • Near-Term
Tax Incentives	Develop tax incentive program for developers and property owners who relocate structures landward, site development in upland areas, conserve open space along the shoreline, and/or preserve or restore natural flood buffers.	State of Hawai'i Department of Taxation	Longer-Term
Transfer of Development Rights Programs	Develop TDR programs that facilitate SLR retreat.	County planning departments	Longer-Term

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