

# Status of Climate Change Adaptation Planning and Implementation in Hawaii



Hawaii Ocean Resources Management Plan Working Group

September 4, 2013

Jesse K. Souki, Director, Office of Planning, State of Hawaii

Nathalie Morison, Planner, Hawaii Coastal Zone Management Program



# State Legislative History

## Act 234 (2007)

- Climate change poses a serious threat
- Rise in sea levels, inundation of Hawaii's freshwater aquifers, damage to marine ecosystems and the natural environment, extended drought and loss of soil moisture, an increase in the spread of infectious diseases, and an increase in the severity of storms and extreme weather events
- Focus on cost-effective GHG emissions reductions at or below Hawaii's GHG emissions estimates of 1990 by January 1, 2020

## Act 20 (2009)

- Created a climate change task force
- Not funded by the previous administration
- Ceased to exist by operation of law on June 30, 2011

## Act 73 (2010)

- Barrel tax to fund greenhouse gas emissions reduction task force (Act 234) and the climate change task force (Act 20)

# Development of Hawaii's Climate Change Adaptation Policy

*Alternative Futures Policy Development Workshop (2011)*

Two day workshop

60+ Stakeholders

4 Futures Scenarios

Climate Change Adaptation Priority Guidelines

Hawaii 2060:  
Visioning Hawaii's Adaptation to Climate Change

A Final Report of the Alternative Futures Exercise at the 2011 Planning Meeting with the Hawai'i Ocean Resources Management Plan Partners



Prepared by Heather Frey, Scott Yim and Rex Troumbley

# Climate Change Adaptation Priority Guidelines

(1) Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities

(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies

(3) Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State

(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change

(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change

# Climate Change Adaptation Priority Guidelines

(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments

(7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options

(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities, including nonprofit entities

(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans

(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy

# Statewide Planning System

## Part I: Overall Theme, Goals, Objectives and Policies

Population

Economy

Physical environment

Facility systems

Socio-cultural advancement

## Part III: Priority Guidelines

Economic

Population Growth

Crime and criminal justice

Affordable housing

Education

Sustainability

Climate Change Adaptation

## Part II: Statewide planning system

### Functional plans

- Define and implement Parts I and II
- Identify priority issues
- Implementing actions

### County general plans

- Zoning
- SMA Permit
- District Boundary Amendments

### State programs

- CIP
- CZM
- LUC
- BLNR

# State Land Use Law

## HRS Chapter 205

### Purpose

- “preserve, protect and encourage the development of the lands in the State for those uses to which they are best suited for the public welfare[.]” See L. 1961, c 187, § 1.

### Implementation Mechanisms

- 5-Year Boundary Review
- District Boundary Amendments
- Important Agricultural Lands Designation
- State Special Use Permits

# Coastal Zone Management Act

## HRS Chapter 205A

### Purpose

- “provide for the effective management, beneficial use, protection, and development of the coastal zone.” See L. 1977, c 188, § 1.

### Implementing Mechanisms

- Special Management Area Permits
- Federal Consistency
- Comprehensive Planning and Coordination
- Ocean Resources Management Plan

# Implementing Hawaii's Climate Change Adaptation Policy



# Outline: Implementing Hawaii's Climate Change Adaptation Policy

## OP-CZM Initiatives

- ORMP 2013 Update
- *County Focus:* Integrating CCA into Existing Planning Frameworks / Identifying Current CCA Projects

## External Initiatives

## Status of Implementation

- Strengths & Opportunities

# Outline: Implementing Hawaii's Climate Change Adaptation Policy

## OP-CZM Initiatives

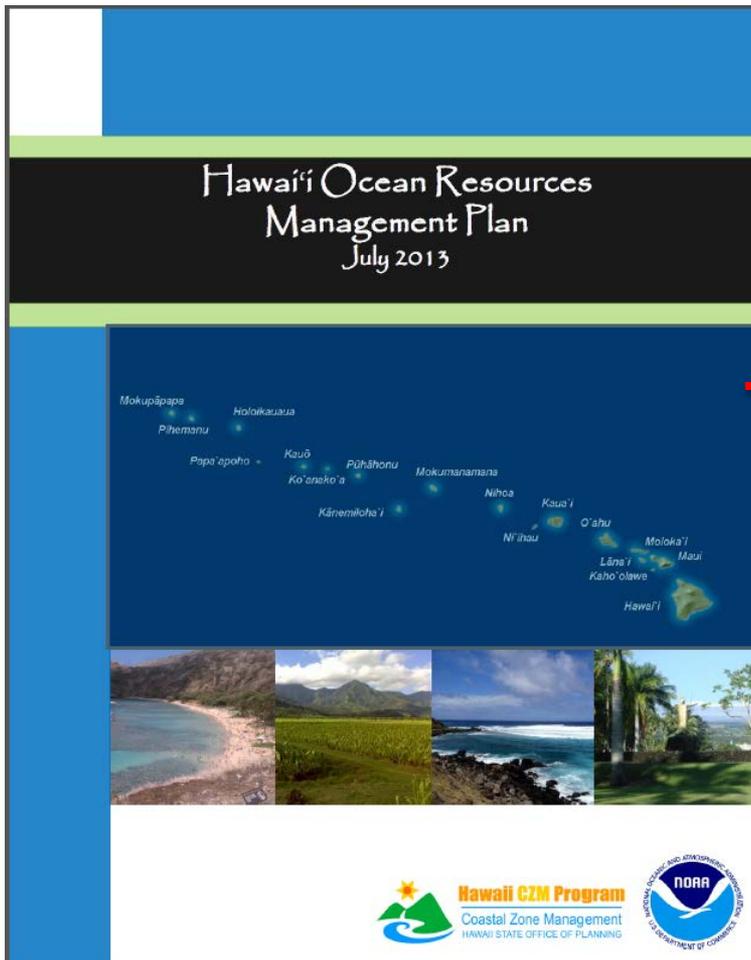
- ORMP 2013 Update
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## External Initiatives

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# OP-CZM Initiatives: ORMP 2013 Update



(8) “Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities, including nonprofit entities;”

# OP-CZM Initiatives: ORMP 2013 Update

**Hawai'i Ocean Resources Management Plan**  
July 2013

**Hawaii CZM Program**  
Coastal Zone Management  
HAWAII STATE OFFICE OF PLANNING

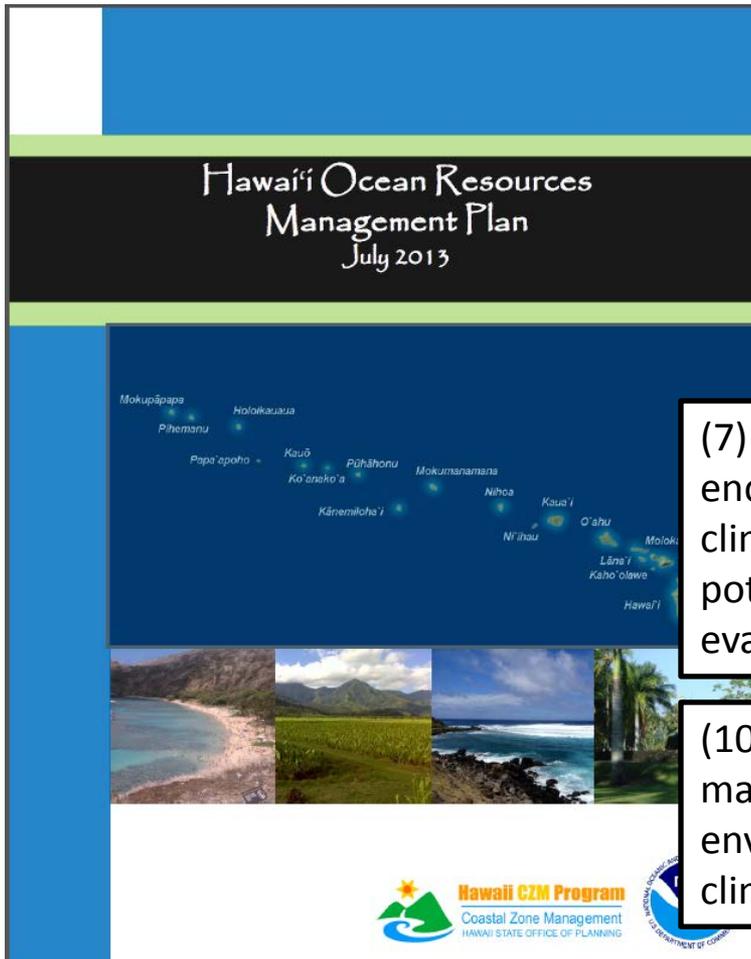
(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

(7) “Promote sector resilience...by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;”

(10) “Encourage planning and management of the natural and built environments that effectively integrate climate change policy;”

Metrics
<p><u>GOAL A:</u></p> <ul style="list-style-type: none"> <li>Increase in number of additional shoreline access (OP-CZM)</li> <li>Increase in number of counties implementing planning practices that include adaptation strategies when planning for coastal areas (OP-CZM)</li> <li>Increase in number of state agencies implementing capital improvement plan projects that include adaptation strategies for coastal areas (OP-CZM)</li> </ul>
<p><u>GOAL B:</u></p> <ul style="list-style-type: none"> <li>Layers added to the statewide GIS that address coastal measures (OP GIS)</li> </ul>
<p><u>GOAL C:</u></p> <ul style="list-style-type: none"> <li>Number of projects reviewed by OP during land use entitlement process that include coastal impact risk assessments(OP-CZM)</li> <li>Number of projects reviewed by DOH during land use entitlement process that include coastal impact risk assessments (DOH)</li> </ul>

# OP-CZM Initiatives: ORMP 2013 Update



	Management Priority Goal(s)	Lead State Agency	Other State and County Agencies	Partners	Metrics
1	Appropriate Coastal Development  <i>Goal A: Adoption of county plans which specify guidance on coastal</i>	OP-CZM	County planning departments, DLNR-OCCL, DOT (Harbors, Airports, and Highways), DOH	FEMA/NFIP, UH Sea Grant College Program, PacIOOS, UH SOEST	<p><u>GOAL A:</u></p> <ul style="list-style-type: none"> <li>Increase in number of additional shoreline access (OP-CZM)</li> <li>Increase in number of counties implementing planning practices that include adaptation strategies when planning for coastal areas (OP-CZM)</li> <li>Increase in number of state agencies implementing capital improvement plan projects that include adaptation strategies for coastal areas (OP-CZM)</li> </ul> <p><u>GOAL B:</u></p> <ul style="list-style-type: none"> <li>Layers added to the statewide GIS that address coastal measures (OP GIS)</li> </ul> <p><u>GOAL C:</u></p> <ul style="list-style-type: none"> <li>Number of projects reviewed by OP during land use entitlement process that include coastal impact risk assessments(OP-CZM)</li> <li>Number of projects reviewed by DOH during land use entitlement process that include coastal impact risk assessments (DOH)</li> </ul>

(7) “Promote sector resilience...by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;”

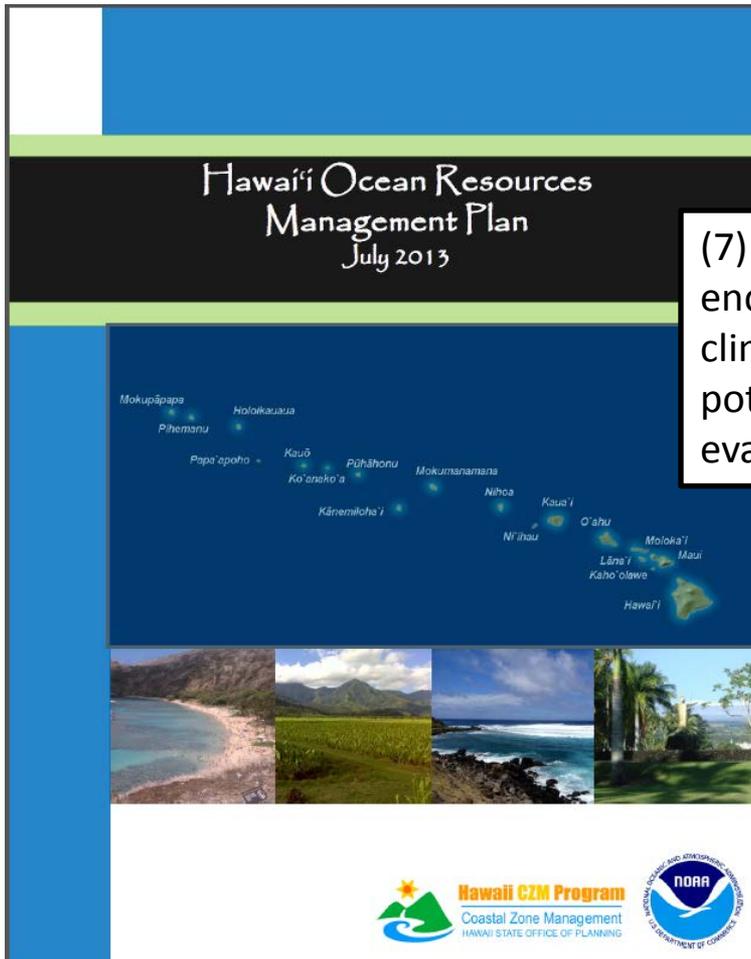
(10) “Encourage planning and management of the natural and built environments that effectively integrate climate change policy;”

# OP-CZM Initiatives: ORMP 2013 Update

(10) “Encourage planning and management of the natural and built environments that effectively integrate climate change policy;”

	Management Priority Goal(s)	Lead State Agency	Other State and County Agencies	Partners	Metrics
2	Management of	OP-CZM	County planning	FEMA/NFIP, U.S. Grant Program, DS, UH Coastal Group, OCR, C, PENM	<p><b>GOAL A:</b></p> <ul style="list-style-type: none"> <li>Develop guidance on how to integrate climate change policy into County Development Plans/Sustainable Community Plans and regulatory permits (OP-CZM)</li> <li>Increase in number of state departments completing coastal hazards risk analysis for their facilities (OP-CZM)</li> <li>Increase in number of County General and Community/Development Plans that include a climate change adaptation component (County planning departments)</li> <li>Creation of greenhouse gas emissions rules (DOH)</li> </ul> <p><b>GOAL B:</b></p> <ul style="list-style-type: none"> <li>Shoreline erosion studies and maps completed for Hawai'i Island, Lanā'i, and Moloka'i (UH-SOEST)</li> <li>Review and update shoreline erosion maps for Kaua'i, Maui, and O'ahu (UH-SOEST)</li> </ul> <p><b>GOAL C:</b></p> <ul style="list-style-type: none"> <li>Increase in number of climate change adaptation training sessions held (OP-CZM)</li> <li>Increase in number of state departments adopting climate change adaptation strategies in their maintenance plans and capital improvement program plans (OP-CZM)</li> </ul>

# OP-CZM Initiatives: ORMP 2013 Update

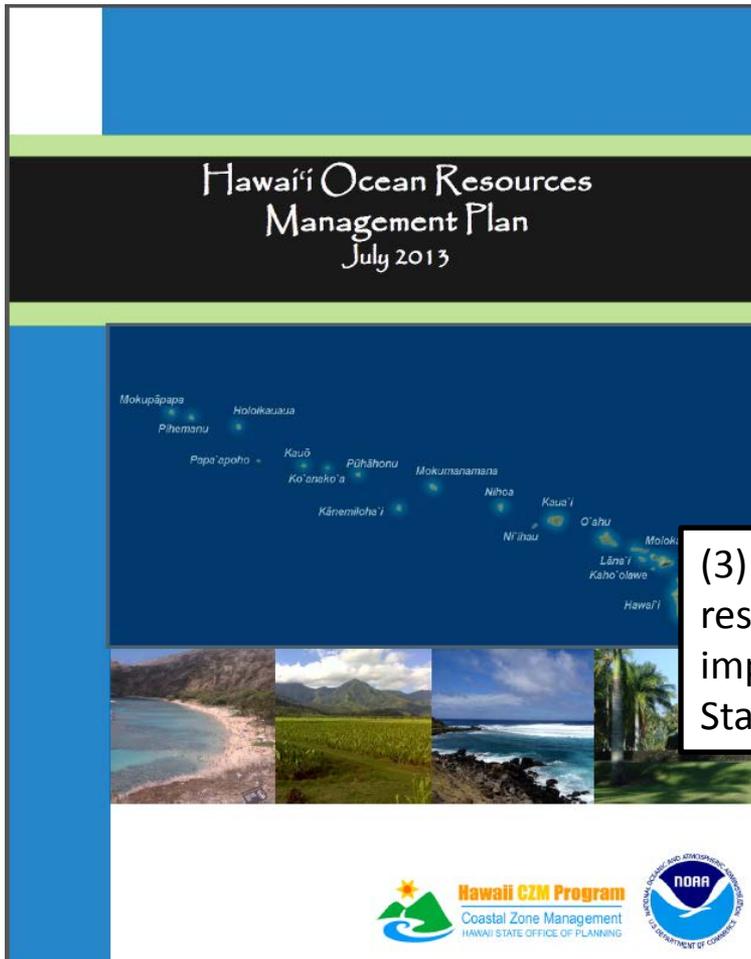


	Management Priority Goal(s)	Lead State Agency	Other State and County Agencies	Partners	Metrics
2	Management of Coastal Hazards <i>Goal A: Support adoption of county laws for Best Management Practices to reduce</i>	OP-CZM	County planning departments, DLNR-OCCL, County and State Civil Defense, DOT, DOH	FEMA/NFIP, UH Sea Grant College Program, PacIOOS, UH SOEST Coastal Geology Group, NOAA OCRM, NOAA RSC, PMNM	<p><b>GOAL A:</b></p> <ul style="list-style-type: none"> <li>Develop guidance on how to integrate climate change policy into County Development Plans/Sustainable Community Plans and regulatory permits (OP-CZM)</li> <li>Increase in number of state departments completing coastal hazards risk analysis for their facilities (OP-CZM)</li> <li>Increase in number of County General and Community/Development Plans that include a climate change adaptation component (County planning departments)</li> <li>Creation of greenhouse gas emissions rules (DOH)</li> </ul> <p><b>GOAL B:</b></p> <ul style="list-style-type: none"> <li>Shoreline erosion studies and maps completed for Hawai'i Island, Lāna'i, and Moloka'i (UH-SOEST)</li> <li>Review and update shoreline erosion maps for Kaua'i, Maui, and O'ahu (UH-SOEST)</li> </ul> <p><b>GOAL C:</b></p> <ul style="list-style-type: none"> <li>Increase in number of climate change adaptation training sessions held (OP-CZM)</li> <li>Increase in number of state departments adopting climate change adaptation strategies in their maintenance plans and capital improvement program plans (OP-CZM)</li> </ul>
	<i>support county and state efforts to develop climate change risk analysis and adaptation strategies for public facilities.</i>				

(7) "Promote sector resilience...by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;"

Increase in number of state departments completing coastal hazards risk analysis for their facilities (OP-CZM)

# OP-CZM Initiatives: ORMP 2013 Update



	Management Priority Goal(s)	Lead State Agency	Other State and County Agencies	Partners	Metrics
2	<p>Management of Coastal Hazards</p> <p><i>Goal A: Support adoption of county laws for Best Management Practices to reduce risks from coastal hazards, including the impacts from climate change.</i></p> <p><i>Goal B: Complete coastal mapping of the Main Hawaiian Islands to assist with management of coastal hazards such as coastal erosion and sea level rise.</i></p> <p><i>Goal C: Collaborate and support county and state efforts to...</i></p>	OP-CZM	County planning departments, DLNR-OCCL, County and State Civil Defense, DOT, DOH	FEMA/NFIP, UH Sea Grant College Program, PacIOOS, UH SOEST Coastal Geology Group, NOAA OCRM, NOAA PSC, PMNM	<p><u>GOAL A:</u></p> <ul style="list-style-type: none"> <li>Develop guidance on how to integrate climate change policy into County Development Plans/Sustainable Community Plans and regulatory permits (OP-CZM)</li> <li>Increase in number of state departments completing coastal hazards risk analysis for their facilities (OP-CZM)</li> <li>Increase in number of County General and Community/Development Plans that include a climate change adaptation component (County planning departments)</li> <li>Creation of greenhouse gas emissions rules (DOH)</li> </ul> <p><u>GOAL B:</u></p> <ul style="list-style-type: none"> <li>Shoreline erosion studies and maps completed for Hawai'i Island, Lāna'i, and Moloka'i (UH-SOEST)</li> <li>Review and update shoreline erosion maps for Kaua'i, Maui, and O'ahu (UH-SOEST)</li> </ul> <p><u>GOAL C:</u></p> <ul style="list-style-type: none"> <li>Increase in number of climate change adaptation training sessions held (OP-CZM)</li> <li>Increase in number of state departments adopting climate change adaptation strategies in their maintenance plans and capital improvement program plans (OP-CZM)</li> </ul>

(3) "Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;"

# OP-CZM Initiatives: ORMP 2013 Update

**Hawai'i Ocean Resources Management Plan**  
July 2013

Mokupāpapa, Pihemanu, Haloikauaia, Papa'opoho, Kauā, Pūhāhonu, Kō'ānaho'a, Mokuāmanamana, Kānemilohe'i, Nihoa, Kaua'i, Niihau, O'ahu, Moloka'i, Lanai, Maui, Kaho'olawe, Hawai'i

**Hawaii CZM Program**  
Coastal Zone Management  
HAWAII STATE OFFICE OF PLANNING

DEPARTMENT OF COMMERCE

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(1) "Ensure that Hawaii's people are educated, informed, and aware of the impacts of climate change may have on their communities;"

Increase in number of climate change adaptation training sessions held (OP-CZM)

# OP-CZM Initiatives: ORMP 2013 Update

	Management Priority Goal(s)	Lead State Agency	Other State and County Agencies	Partners	Metrics
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**Hawai'i Ocean Resources Management Plan**  
July 2013

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Coastal Zone Management  
HAWAII STATE OFFICE OF PLANNING

(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

(7) “Promote sector resilience...by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;”

(10) “Encourage planning and management of the natural and built environments that effectively integrate climate change policy;”

- GOAL A:**
- Develop guidance on how to integrate climate change policy into County Development Plans/Sustainable Community Plans and regulatory permits (OP-CZM)
  - Increase in number of state departments completing coastal hazards risk analysis for their facilities (OP-CZM)
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- GOAL C:**
- Increase in number of climate change adaptation training sessions held (OP-CZM)
  - Increase in number of state departments adopting climate change adaptation strategies in their maintenance plans and capital improvement program plans (OP-CZM)

# Summary of CCA Implementation in ORMP 2013 Update

(1) "Ensure that Hawaii's people are educated, informed, and aware of the impacts climate change may have on their communities;"

ORMP Management Priority #2 – Goal C

(2) "Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;"



(3) "Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;"

ORMP Management Priority #2 – Goal B

(4) "Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;"



(5) "Encourage the preservation and restoration of natural landscape features ... that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;"



(6) "Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;"

ORMP Management Priority #1 – Goal A

ORMP Management Priority #2 – Goal C

(7) "Promote sector resilience ... by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;"

ORMP Management Priority #1 – Goals A, C

ORMP Management Priority #2 – Goals A, C

(8) "Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities...;"

ORMP 2013 UPDATE

(9) "Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans;"

ORMP Update Process

(10) "Encourage planning and management of the natural and built environments that effectively integrate climate change policy."

ORMP Management Priority #1 – Goals A, C

ORMP Management Priority #2 – Goals A, C

# Outline: Implementing Hawaii's Climate Change Adaptation Policy

## OP-CZM Initiatives

- ORMP 2013 Update
- County Focus: Integrating CCA into Existing Planning Frameworks / Identifying Current CCA Projects

## External Initiatives

## Status of Implementation

- Strengths & Opportunities

# Integrating CCA into Existing Planning Frameworks

## COUNTY



## General Plan (GP) & Development Plan (DP) Updates

- *Options for Implementing the Hawaii State Planning Act Climate Change Adaptation Priority Guidelines - CRest*
- *A Process Design for Community Engagement in Climate Adaptation Planning – Kem Lowry*

(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

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# Integrating CCA into Existing Planning Frameworks

## COUNTY



## General Plan (GP) & Development Plan (DP) Updates

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(2) “Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;”

(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

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# Identifying Current CCA Projects

## What are Counties already doing?

On-going planning efforts and projects that consider climate change impacts and include adaptation strategies

### *Spotlight:* Dune Restoration in South Maui

- County of Maui, UH Sea Grant, and Hoaloa `Aina



# Identifying Current CCA Projects

(2) “Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;”

(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

(5) “Encourage the preservation and restoration of natural landscape features...that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;”

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- County of Maui, UH Sea Grant, and Hoaloa `Aina



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# External Initiatives

(1) “Ensure that Hawaii’s people are educated, informed, and aware of the impacts climate change may have on their communities;”

*Pacific Islands Climate Education Partnership*  
(Chip Fletcher, UH-SOEST)

(2) “Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;”

*Mahuahua ‘Ai o Hoi*  
(Kako’o ‘Ōiwi)

(3) “Invest in continued monitoring and research of Hawaii’s climate and the impacts of climate change on the State;”

PICCC; PaCIOOS; PICSC;  
Pacific RISA; PaCIS; UH-SOEST; UH Sea Grant; NOAA

*Evaluation of Kauai’s Changing Shorelines* (KCC, UH Sea Grant, PMRF)

(4) “Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;”

*Learning from TEK...in Kaupulehu, Hawaii Island*  
(UH-Manoa)

(5) “Encourage the preservation and restoration of natural landscape features ... that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;”

*The Rain Follows the Forest* (DLNR)

*Kailua Beach Management Plan*  
(DLNR-OCCL)

*Hawaii Coral Reef Strategy* (DLNR-DAR)

(6) “Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;”

Various UH Sea Grant Publications

e.g. Alternatives to shoreline protection

(7) “Promote sector resilience ... by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;”

*Transportation Asset Climate Change Risk Assessment* (OMPO)

*Climate Change and the Visitor Industry* (UH Sea Grant; HTA)

*Risk and Vulnerability Assessment of SLR in Honolulu* (UH Sea Grant; NOAA CSP)

(8) “Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities...;”

*State of Hawaii Hazard Mitigation Plan Update 2013*

(9) “Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans;”

e.g. Erosion rate-based Setbacks  
(Maui / Kauai Counties)

e.g. Sea Level Rise and Coastal Inundation Viewer  
(NOAA)

(10) “Encourage planning and management of the natural and built environments that effectively integrate climate change policy.”

*Hawaii Island Commercial Harbors 2035 Master Plan Update*  
(DOT-Harbors)

*Draft Lana‘i Community Plan 2013 Update*

# Outline: Implementing Hawaii's Climate Change Adaptation Policy

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## Status of Implementation

- Strengths & Opportunities

# Status of Implementation

## Strengths

- Wealth of climate science research
- Several preservation/restoration plans in place
- Sector vulnerability assessments
- Cross-jurisdictional collaboration

## Opportunities

- Education/Outreach
- Community engagement
- Integration of TEK
- Evaluation of alternatives; cost-benefit analysis
- Sector-specific adaptation strategies
- Adaptive management
- Continued integration of CCA into County Plans

# Mahalo!

## Jesse K. Souki

Director, Office of Planning, State of  
Hawaii

[jesse.k.souki@dbedt.hawaii.gov](mailto:jesse.k.souki@dbedt.hawaii.gov)

## Nathalie Morison

Planner, Hawaii Coastal Zone  
Management Program

[Nathalie.M.Morison@dbedt.hawaii.gov](mailto:Nathalie.M.Morison@dbedt.hawaii.gov)

Phone: (808) 587-2846

Web: <http://planning.hawaii.gov>



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