

January 11, 2018

Managed Retreat Symposium



**Assessing the Feasibility and Implications
of Managed Retreat Strategies for
Vulnerable Coastal Areas in Hawai'i**



Hawaii CZM Program
Coastal Zone Management

SSFM
International

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Today's Agenda

Morning

- Introduction & Project Context
- Keynote Speaker #1
- Finance / Tax / Economics Panel
- Insurance / FIRM Panel
- Working Lunch (12:15-1:15)

Afternoon

- Keynote Speaker #2
- Legal / Policy Panel
- Open Space / Public Access / Social Justice Panel
- Wrap-Up Discussion



Project Team Introductions

- State of Hawai‘i, Office of Planning, Coastal Zone Management Program
- SSFM International
- David Tarnas, MCS International
- Chip Fletcher, UH Manoa
- Kem Lowry, UH Manoa
- Rebecca Soon, Pacific Solutions

The Context for Managed Retreat

A tropical coastal scene featuring a prominent stone wall in the foreground, palm trees, and a rocky beach leading to the ocean. The sky is blue with some clouds.

**MELISSA WHITE,
SSFM INTERNATIONAL**



What is Managed Retreat?

- A purposeful effort to divert development away from vulnerable coastal areas
- It involves a mix of planning, regulatory tools, incentives, land acquisition, and protection
- Can sometimes be prompted by natural disasters
- Requires community involvement in planning and implementation



Retreat as a Climate Adaptation Strategy

- **Accommodation:** Adapting structures and systems to allow them to better withstand changing conditions, such as flood proofing and elevating structures
- **Protection:** Dikes, berms, and other tools to harden shorelines or structures in their present location
- **Retreat:** Re-locating structures, communities, highways and other infrastructure from vulnerable coastal areas, and minimizing new development in vulnerable areas



Ongoing State Efforts Addressing Climate Change and Coastal Hazards

2013 Ocean Resources Management Plan (ORMP) to Achieve State-wide Comprehensive and Integrated Ocean and Coastal Resources Management

Building Code Amendments to Reduce Existing and Future Stock Vulnerability to Coastal Hazards and Climate Impacts in the City & County of Honolulu, HI

Statewide Sea Level Rise (SLR) Vulnerability Assessment and Adaptation Report

ORMP Appropriate Coastal Development and Management of Coastal Hazards Action Team (ACT) Project on the Feasibility of Managed Retreat

Building Resilience to Coastal Hazards and Climate Change in Hawaii

Develop Statewide Probabilistic Tsunami Design Zone Maps for a 2,500-year Maximum Considered Tsunami



Project Goals

- Assess the feasibility and implications of implementing managed retreat strategies
- Support the State Office of Planning's climate adaptation coordination activities
- Complement the efforts of the Appropriate Coastal Development and Management of Coastal Adaptation Action Team (ACT) and the Climate Commission



Project Tasks

1. **Background Report:** Review plans, programs, policies, case studies, and tools relevant to managed retreat in Hawaii.
2. **Case Studies:** Explore how managed retreat strategies could interact with four different types of development across Hawaii.
3. **Symposium:** Obtain feedback from various stakeholders and industries.
4. **Final Report:** Assess the feasibility of various managed retreat strategies for Hawai'i.



Tools for Managed Retreat

Regulatory Tools

Flood Insurance

Real Estate Disclosure

Tax Incentives

Beach Protection Policies

Updating Flood Hazard Zones

Shoreline Armoring Restrictions

Rebuilding Restrictions

Downzoning / Zoning Overlay

Mitigation or In-Lieu Fees

Tools for Acquiring Land

Eminent Domain

Coastal Land /
Acquisition Programs

Buyouts

Rolling Easements

Conservation
Easements

Condemnation

Tools for Providing Land

Land Swaps

Transfer of
Development Rights

Planned
Neighborhood
Relocation

On-site Relocation

A photograph of a man in a green shirt and pink shorts holding a child on a beach promenade. In the background, a large, powerful wave is crashing against a concrete barrier, creating a massive splash of white water. The sky is clear and blue.

Preliminary Findings & Key Issues Related to Managed Retreat

**DR. KEM LOWRY,
UH MANOA**



SLR Vulnerability Assessment and Adaptation Report (2017)

Establishes a baseline understanding of vulnerable coastal areas and potential impacts.

Three components to vulnerability:

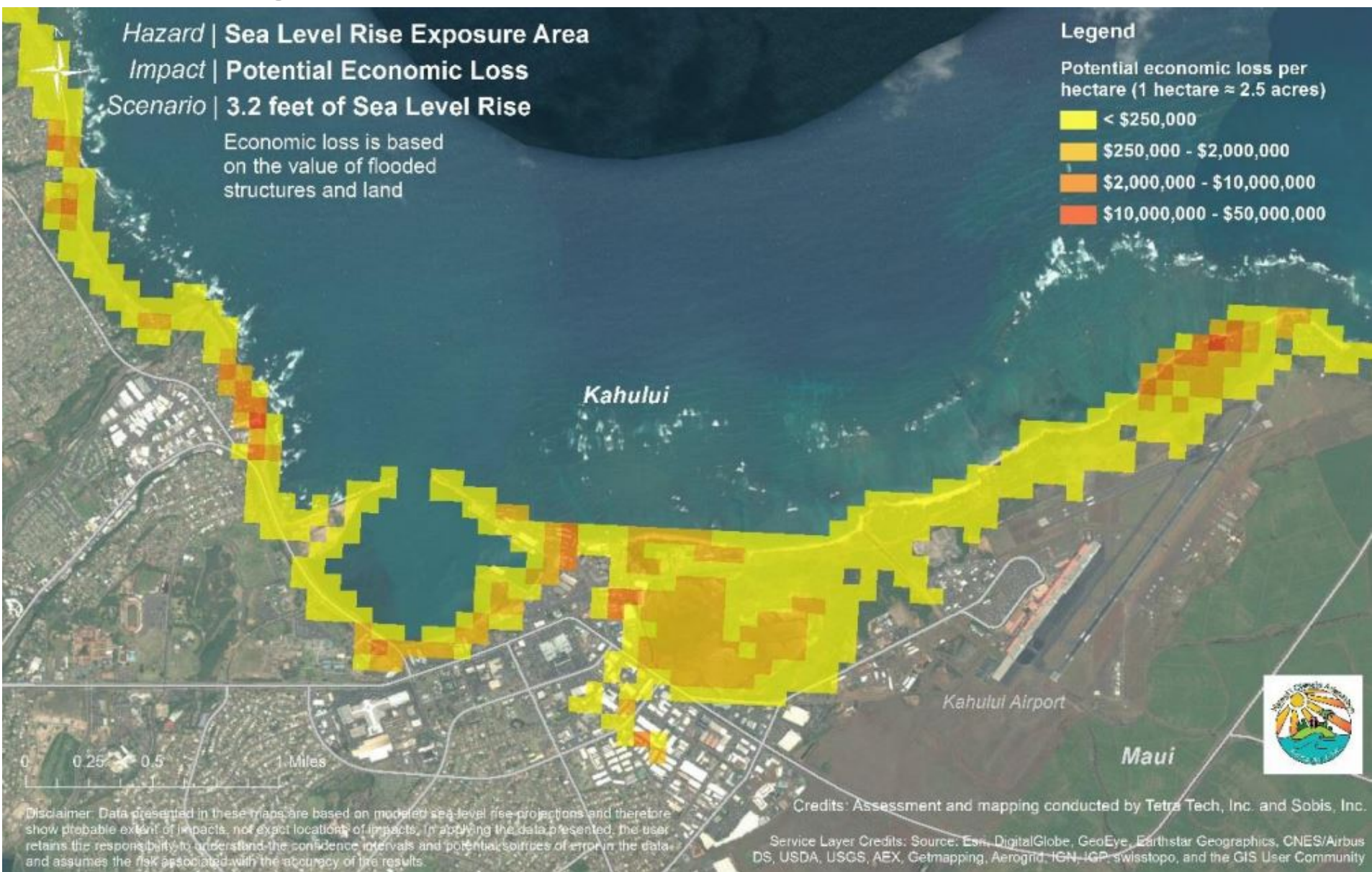
- Areas exposed to sea level rise, passive flooding, potential high wave flooding, and coastal erosion + 1% chance events
- Sensitivity of people, places, things to harm from climate threats
- Ability to respond effectively to flooding and other threats



Potential Impacts of Chronic Flooding in Hawaii

- 25,800 acres of land in Hawaii would be unusable
- 6,500 structures near the shoreline would be compromised
- A minimum of \$19 billion in direct economic losses, not counting costs of replacing roads, utilities and other public infrastructure

SLR Exposure Area: Kahului



SLR Exposure Area: Honokohau Bay



MANAGED RETREAT CASE STUDIES





Case Study Tasks

- Select one development type per county to examine implications of managed retreat (single family; resort/condo; urban; critical infrastructure).
- Conduct site analysis of land uses and ownership, environmental and economic conditions, existing and potential risks, and other information.



Case Study Tasks (Cont.)

- Conduct site visits and meet with local officials.
- Identify key stakeholders that would be involved in and/or affected by managed retreat.
- Conduct focus groups on current conditions, potential natural hazard risks, and the factors and issues affecting the appropriateness of managed retreat strategies.



Case Selection

Four sites chosen:

- Maui – condominium/resort development
- Oahu – critical infrastructure
- Hawaii Island – single family homes
- Kauai – urban area



Maui
20



Maui - Hotel / Resort

Case Conditions

- Active erosion threats at site
- Critical infrastructure and roads could be undermined
- Multiple private owners and mortgagees; underlying property may be leasehold
- Much of shoreline is armored
- Tourism is important to local economy
- Uncertain role of insurance

Oahu





Oahu – Critical Infrastructure

Case Conditions

- Limited and costly options for protecting or relocating infrastructure at some sites
- Accelerated erosion at some sites
- Loss of iconic beaches to erosion and/or shoreline armoring
- Scale of issues—multiple homes/facilities threatened at some sites
- Need for multi-agency coordination
- Legal and permitting issues associated for repair or rehabilitation of infrastructure

Hawaii Island





Hawaii Island – Single Family Homes & Neighborhoods Case Conditions

- Several houses/communities are vulnerable to sea level rise
- Local government considering some areas for acquisition
- Retreat at neighborhood scale might be possible at some sites
- Certain areas have sensitive coastal areas



Kauai





Kauai – Urban Area

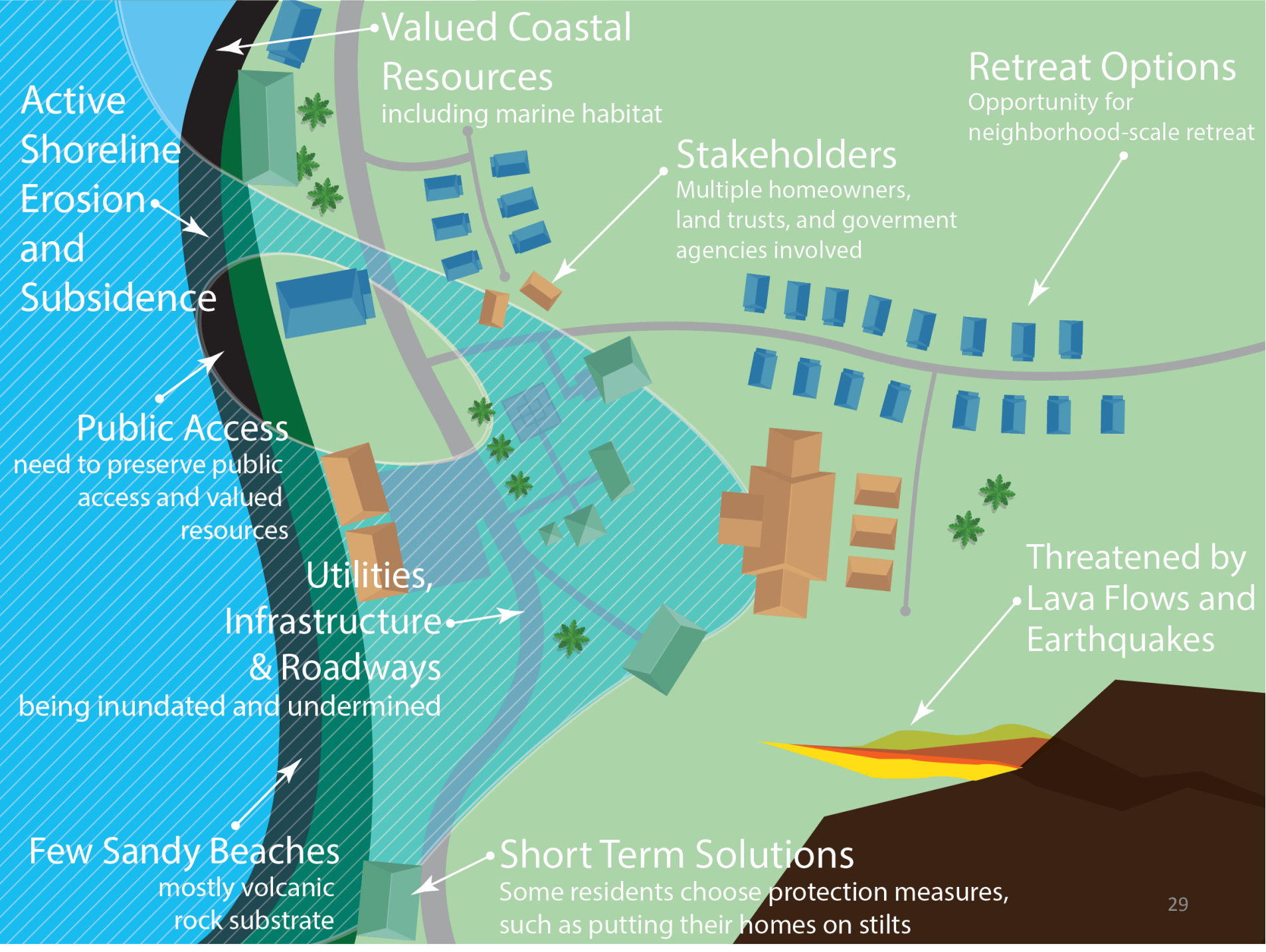
Case Conditions

- Urban area partly in existing hazard zone and subject to increased flooding and erosion
- Significant tourism and small business economy
- Critical state highway runs through community in potential inundation area
- 3 ft of sea level rise would inundate most makai development
- Area could eventually become barrier island because of existing mauka wetland



Scenario-Based Focus Groups

- 14-20 businesspeople, community reps, government officials, coastal property owners, and advocacy groups invited to participate in each focus group
- Participants invited to share their private views on coastal hazards and possible retreat from vulnerable areas
- Focus Group lasted 3 hours



Active Shoreline Erosion and Subsidence

Valued Coastal Resources
including marine habitat

Retreat Options
Opportunity for neighborhood-scale retreat

Stakeholders
Multiple homeowners, land trusts, and government agencies involved

Public Access
need to preserve public access and valued resources

Utilities, Infrastructure & Roadways
being inundated and undermined

Threatened by Lava Flows and Earthquakes

Few Sandy Beaches
mostly volcanic rock substrate

Short Term Solutions
Some residents choose protection measures, such as putting their homes on stilts



Topics Explored in Focus Groups

- Personal understanding of coastal hazards
- Resources affected by coastal hazards
- Perceptions of managed retreat vs. other climate adaptation strategies
- Who needs to be involved in implementing managed retreat
- Factors that would influence decision to retreat

ISSUES RELATED TO MANAGED RETREAT IN HAWAII



Financing

Insurance

Legal / Policy

**Public Access / Open Space /
Social Justice**



Financing

- How will retreat be funded?
- Can funding be set aside now to aid in retreat for post-disaster scenario?
- What are the fiscal implications of relocating communities and critical infrastructure?
- What is the fiscal impact of managed retreat to tourism and other industries?



Insurance

- What is the government's and the private sector's role in reducing vulnerability?
- How can we update Federal Flood Insurance Maps and expand hazard zones to account for SLR?
- How will perception of risk and instability affect people's decisions to relocate?



Legal / Policy

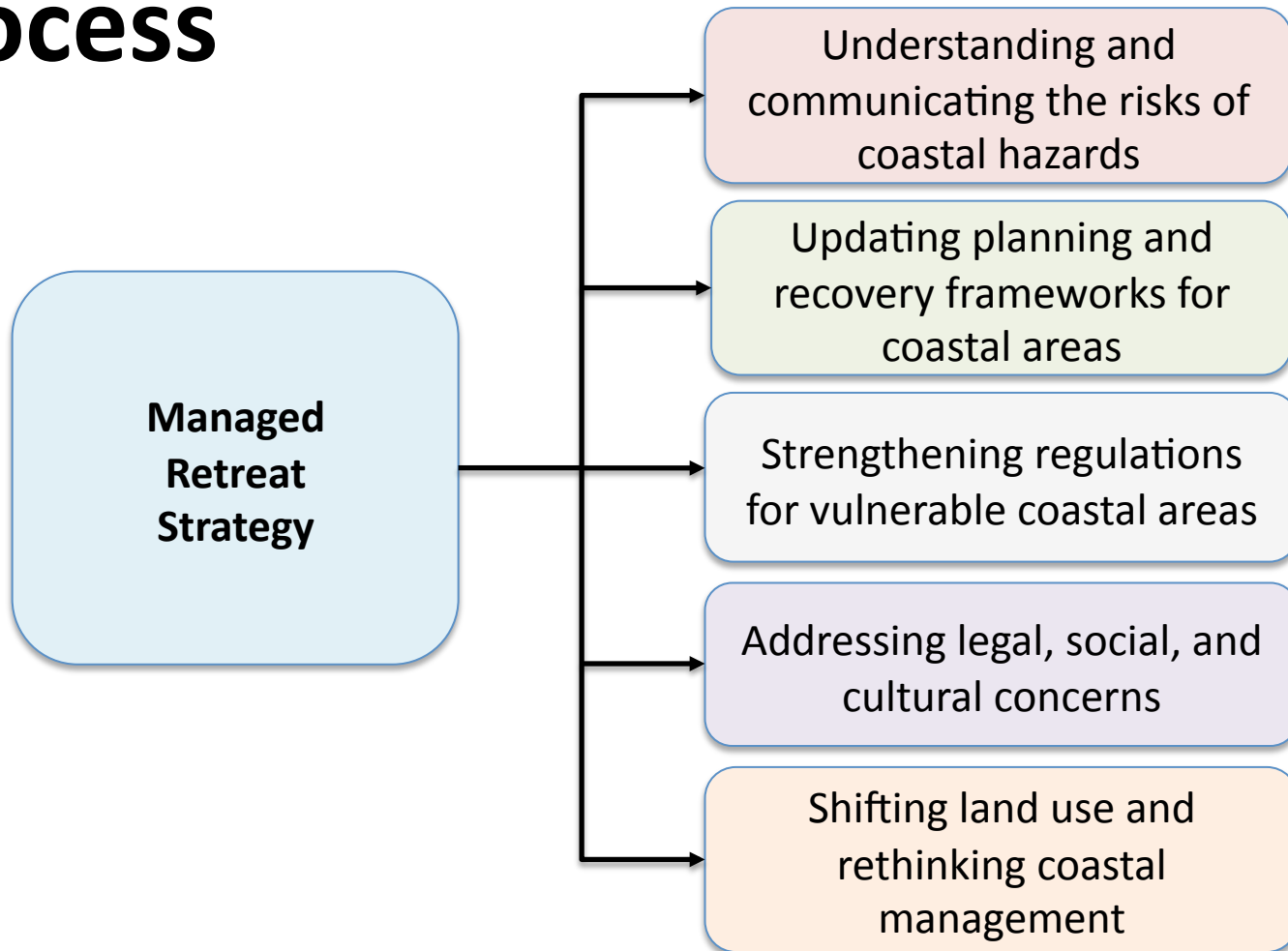
- What are the potential legal issues arising from managed retreat?
- What are the optimal strategies for engaging communities in development and implementation of retreat strategies?
- How can we implement post disaster redevelopment requirements that promote retreat?
- What mechanisms can encourage voluntary relocation of households from vulnerable coastal areas?



Public Access / Open Space / Social Justice

- Would retreat affect demographics inland and coastal communities?
- How might buyouts be applied equitably, not just to the benefit of wealthy coastal landowners?
- What areas should be prioritized for protection and preservation?
- How can sense of community among those retreating be maintained?

Preliminary Findings: Managed Retreat as a Planned & Phased Process





Our Goals for Today:

1. Further the discussion of managed retreat as a potential climate adaptation strategy in Hawaii, and better understand its opportunities and challenges.
2. Learn from managed retreat examples that have been done elsewhere.
3. Discuss with stakeholders which tools are most appropriate for Hawaii.
4. Better understand the appropriate next steps involved in implementing managed retreat as part of Hawaii's climate adaptation strategy.