

CAR.Committee

From: Michael Foley <mfoley@OCEANIT.COM>
Sent: Monday, June 01, 2020 8:22 AM
To: CAR.Committee
Subject: CAR-9 Presentation
Attachments: Coastal Restoration - Maui County Council - CAR Committee 20200601.pdf

Aloha,

Please find the presentation for the CAR Committee attached to this email.

Aloha,
Mike



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Coastal Restoration

*To Mitigate Sea Level Rise
and Shoreline Erosion*

Mike Foley, Ph.D., P.E.

Presented to:
*Council of the County of Maui
Climate Action and Resilience
Committee*

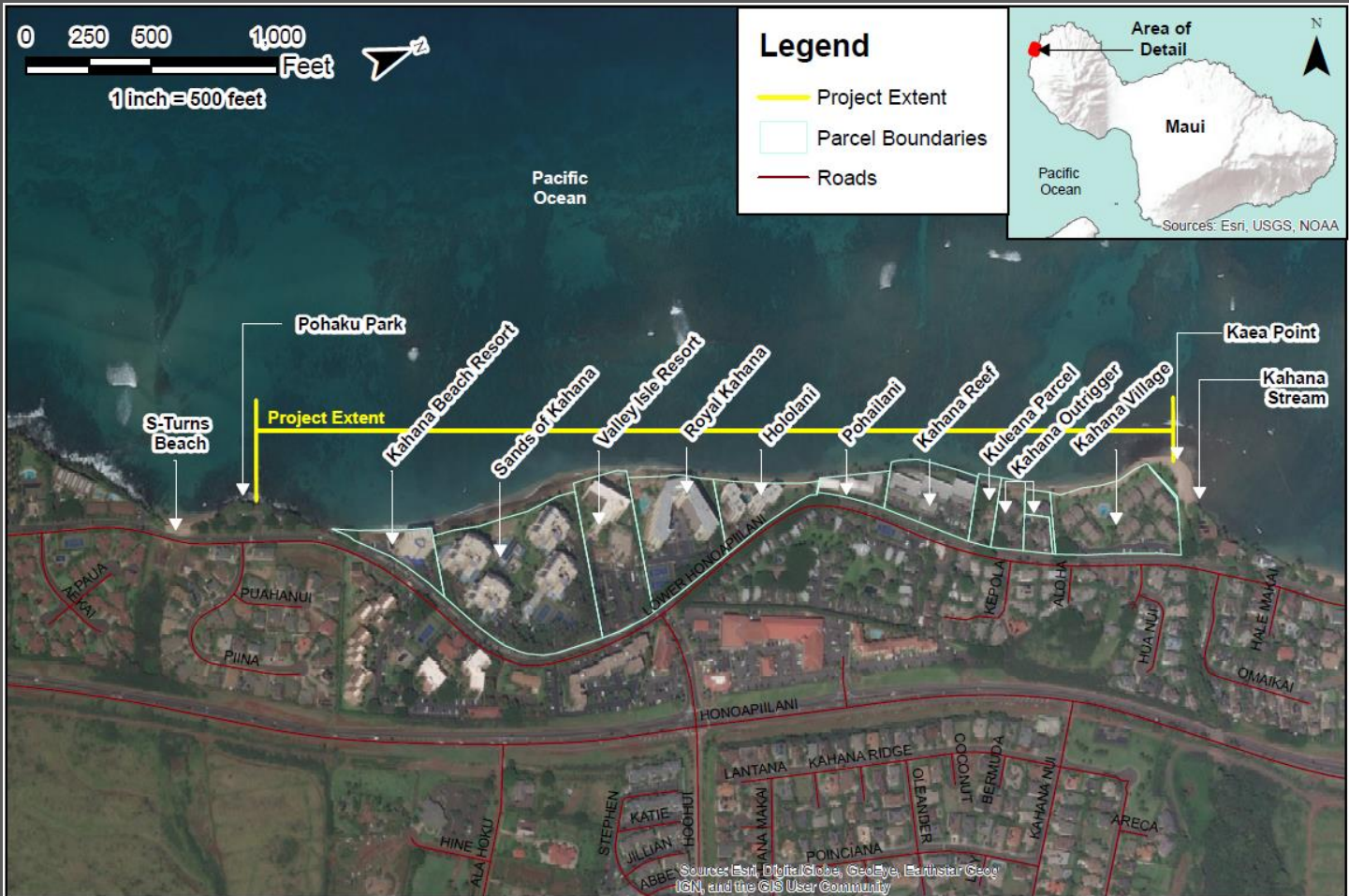
June 1, 2020

Restoration of Coastal Systems



- Example of Kahana Beach
- Common Issues
- Solutions
 - Partnerships
 - Policy
 - Innovation

Kahana Beach



Sources: Esri, DigitalGlobe, GeoEye, Earthstar (Geo), IGN, and the GIS User Community

Kahana Beach - 1949



Kahana Beach - 1975



Kahana Beach - 1988



Kahana Beach - 2007



Kahana Beach - 2016



Loss of Resilience

Loss of Public Beach



Pohailani Condominiums

Photo Credit: Maui County Planning Department





Public Safety Hazard 2016 storm event example

Photo Credit: Maui County Planning Department

**Project
Objective**

Prepare a
Sustainable and
Resilient Solution to
Mitigate the
Erosion of Kahana
Beach



Kahana Beach Restoration Concepts:

1) Beach Nourishment

2) Stabilized Beach Nourishment

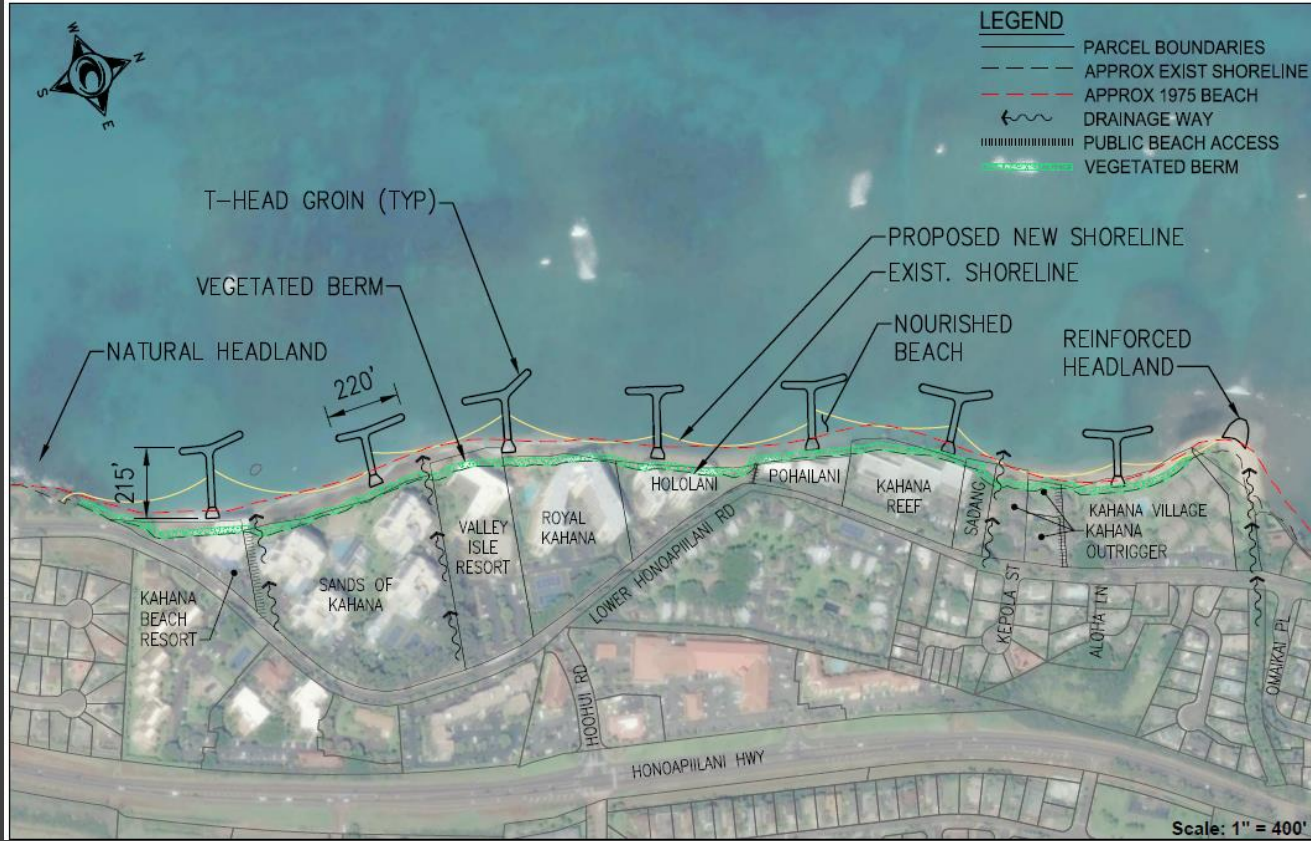


Offshore Sand Resources

Beach Nourishment



Stabilized Beach Nourishment



Waikīkī Beach - 2012



Nourished Beach

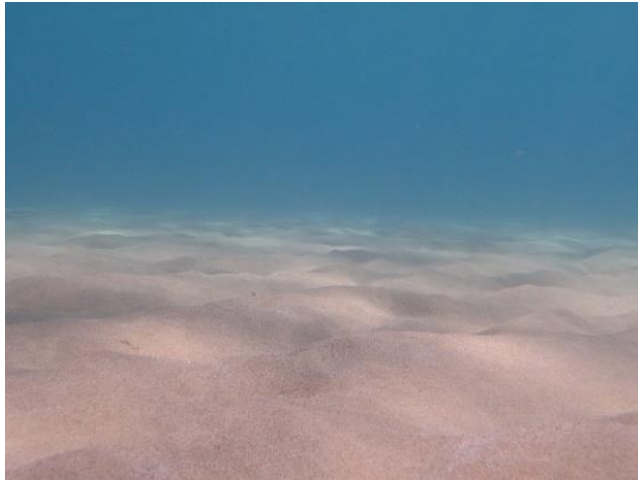
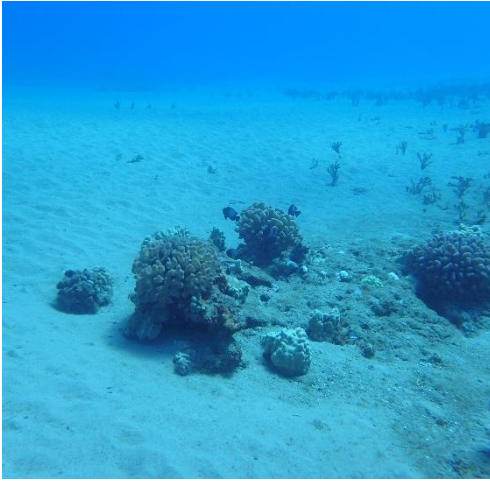
Stabilization Structure

State of Hawaii, Department of Land and Natural Resources, Office of Conservation and Coastal Lands



Sand collected from Site 22

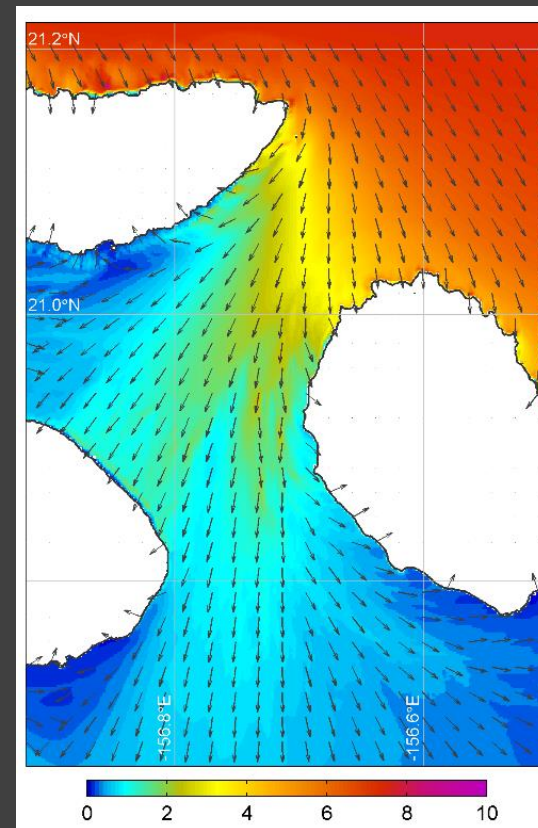
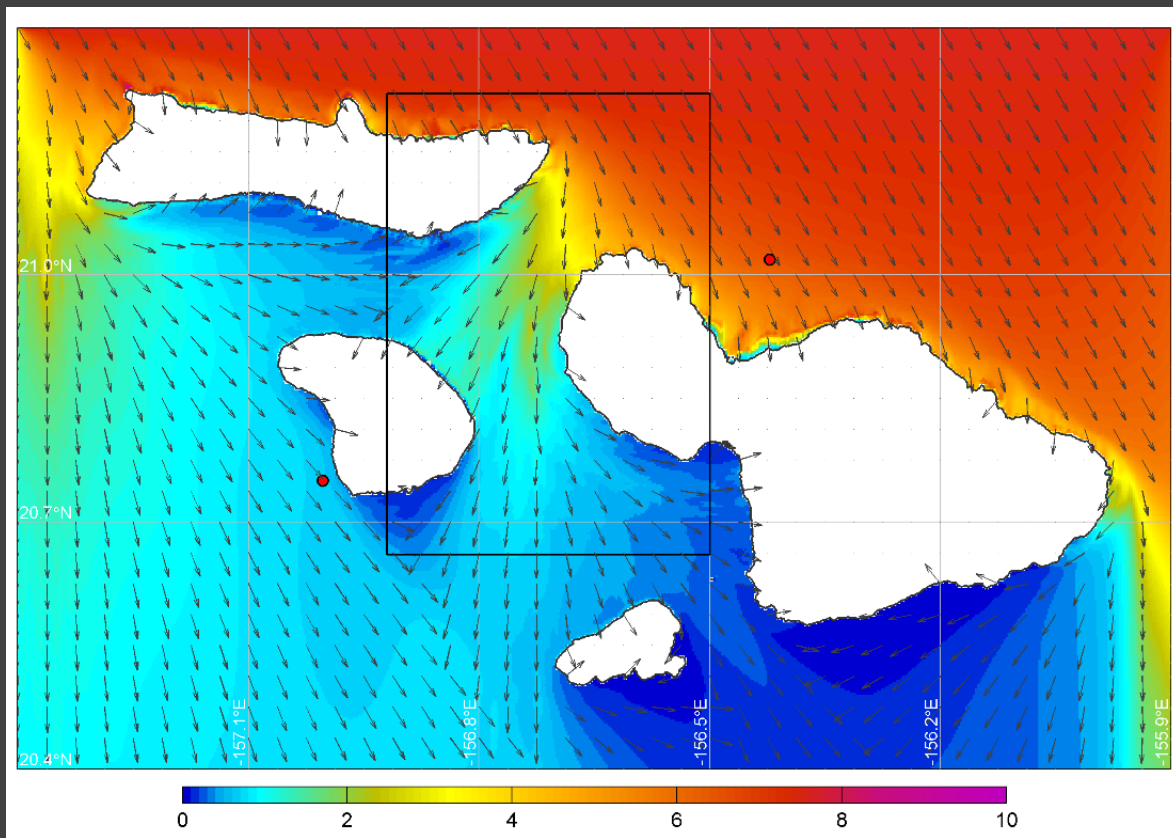
Investigations – Sand Resources

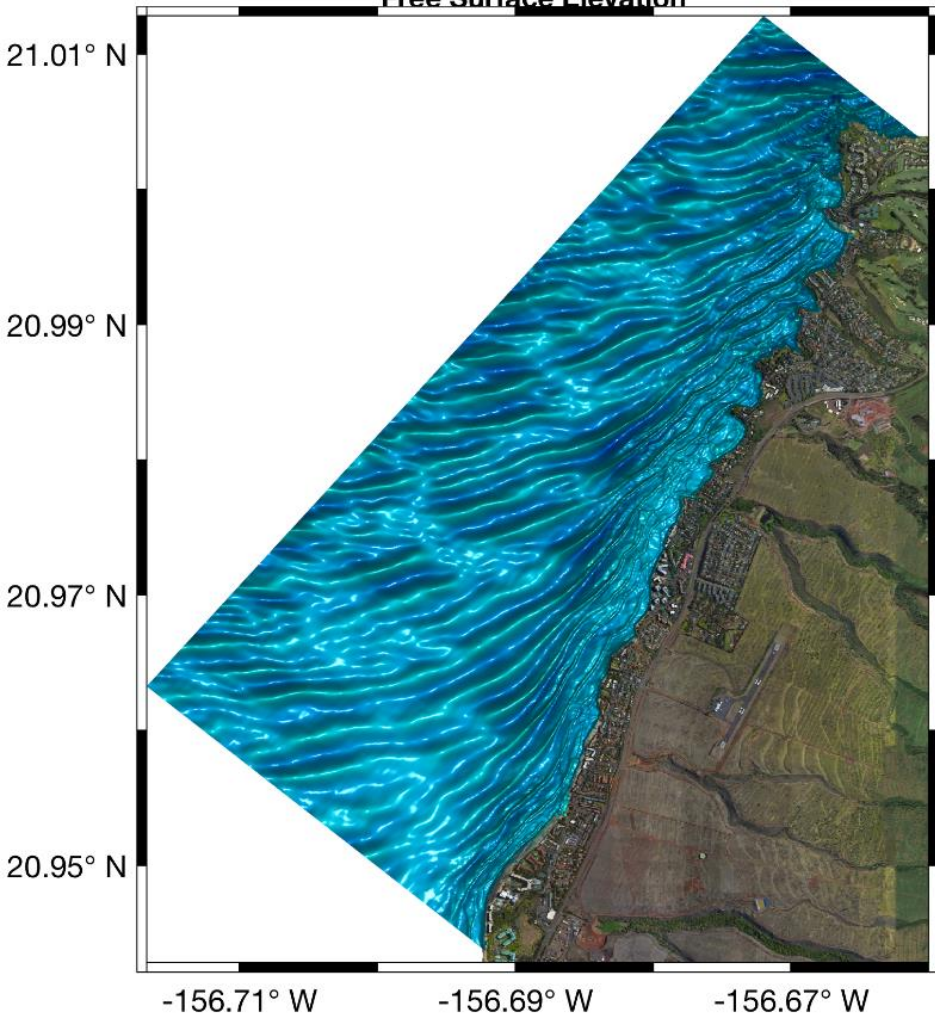
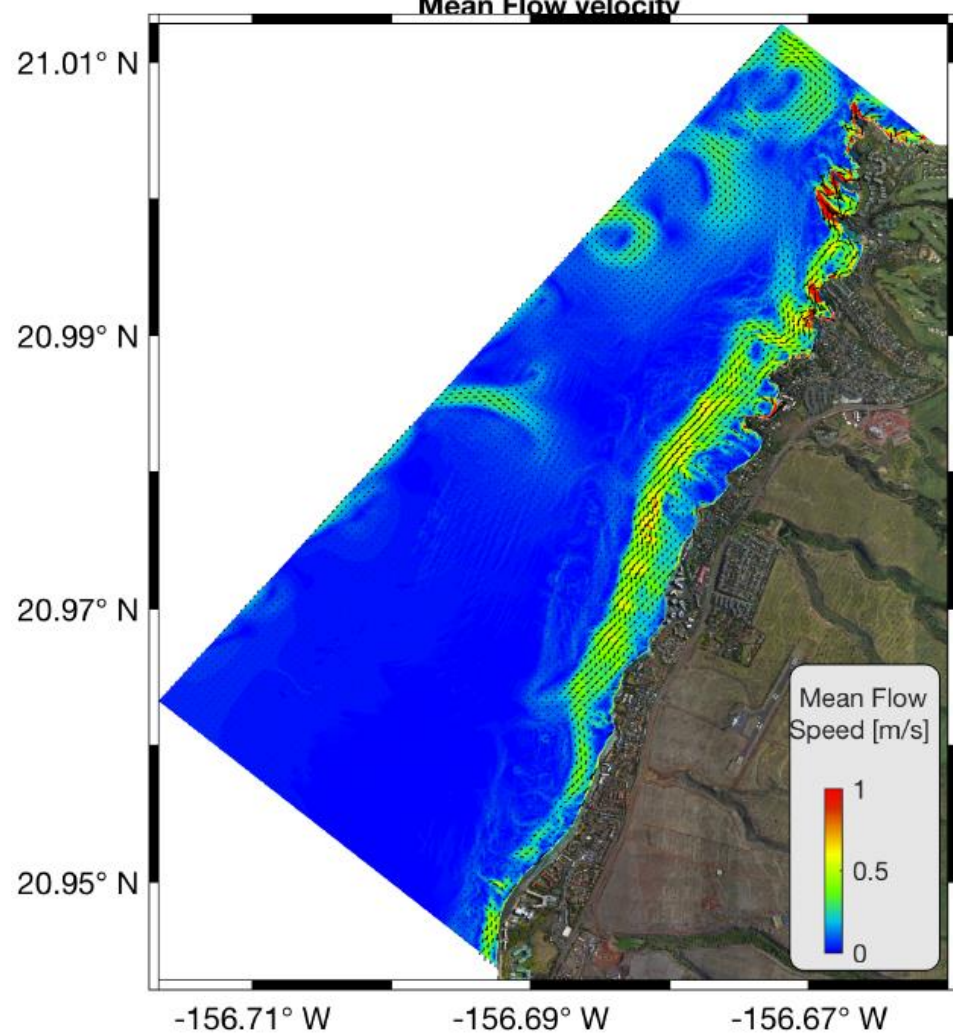


Investigations - Benthic Environment

Investigations – Waves

NW Swell Event

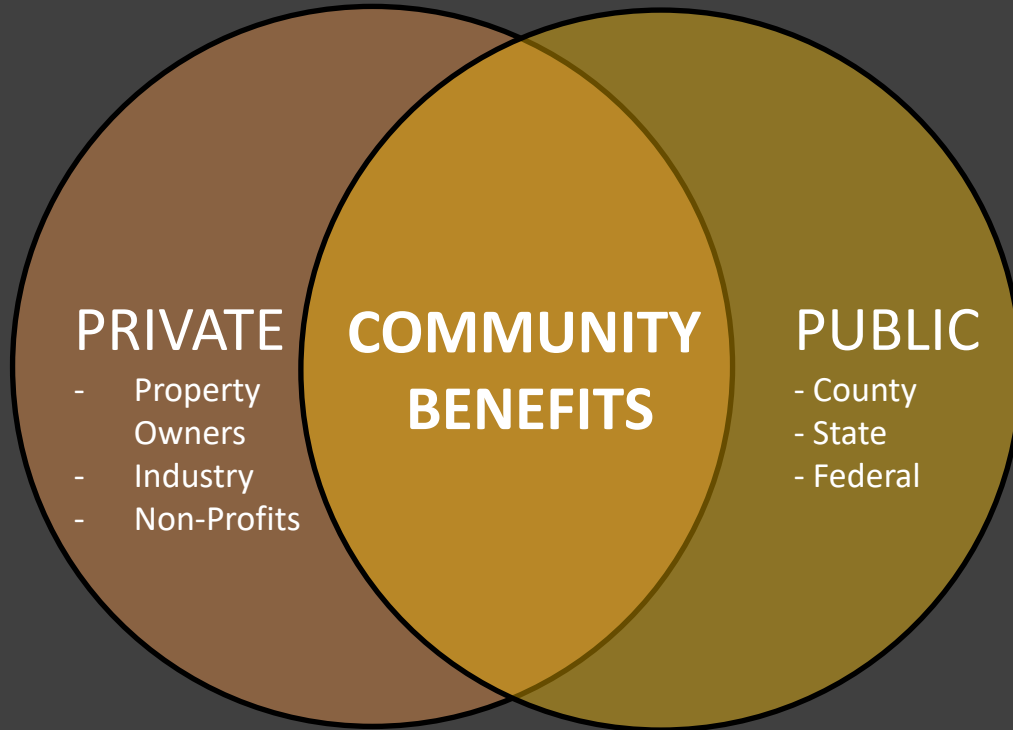


Free Surface Elevation**Mean Flow velocity**

Common Coastal Restoration Issues in Hawaii

- Environmental Concerns
 - Ocean Water Quality
 - Coral Reef Resources
 - Wildlife Habitat
 - Fishing Grounds
 - Surfing Breaks
 - Nearshore Currents
 - Archeological Resources
- Alternative Assessments
 - Shoreline Armoring (e.g., Seawalls)
 - Managed Retreat
- Climate Change Projections
 - Sea Level Rise
 - Future Storm Events
- Funding
 - Studies, Design, Documents, etc.
 - Construction
 - Maintenance
- Government Regulations and Policies
 - Federal, State & Local Approvals
- Ownership Responsibilities
 - Structures on State Land
 - Liabilities, Insurance, Maintenance
- Relationships
 - Critical for Success of Regional Efforts
 - Public-Private Partnerships

Coastal Restoration Partnerships



- Community Facilities Districts
 - Kahana Beach
- Special Improvement Districts
 - Waikiki Beach
- County Services, Policies & Programs
- Tax Incentives



Potential Innovations

Advanced Technology

- Data collection, processing
- Numerical simulations

Design by Nature

- Living Reef Structures
- Biomimicry in Engineering

Traditional Knowledge

- Ahupua'a or Watershed Management
- Loko Kuapā or Walled Ponds



Questions?