SCIENCE RESEARCH & DATA REQUIREMENTS FOR PROTECTING HAWAII'S COASTAL ZONE

Jim Buika, County of Maui Planning Department

Coastal Data Exchange Conference
May 30, 2014

Image: County of Maui, Jim Buika


…To be replaced by this

Maui has lost more than four miles of sandy beach in past century — report

University of Sydney / ANDREW D. SHORT photo

Kaanapali Beach has shown an annual erosion rate of 3.2 inches over the last century, according to a U.S. Geological Survey and University of Hawaii report. Maui has lost 4.2 miles of sandy beach in the last century, according to the report, which is titled "National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands."

By LEE IMADA, News Editor

HONOLULU – Eighty-five percent of sandy beachfront has eroded and 4.2 miles has been lost on Maui in the past century, according to a U.S. Geological Survey and University of Hawaii report released this week.

Those percentages were the highest in the report covering 150 miles of sandy shoreline or "essentially every beach" on Maui, Oahu and Kauai.

"The entire Kihei coast is eroding, except for a handful of places where sand is being trapped by walls," said Charles Fletcher, associate dean of the University of Hawaii School of Ocean and Earth Science and Technology and lead author of the report "National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands."

The "spires of the French Frigate Shoals" will be the inevitable fate of the Hawaiian Islands in millions of years and sea level rise is a natural factor in erosion, the report said. But the erosion is not all natural, and seawalls are among the leading man-made culprits.

In Kihei, which the report said lost 1.2 miles of beaches from 1900 to 2007, Fletcher noted how seawalls sprung up one after another along the Halama Street area near Kalama Park as residents attempted to protect their shorefronts. Erosion rolled north and beaches were lost.

"If you have a beefy seawall, it will protect the land

See BEACHFRONT on the next page


In 2013, two 1200-foot revetments completed to protect threatened coastal highway in West Maui by HDOT under emergency declarations
Over the next several years, Maui will add another mile of sea walls to our shoreline.
08.14.2012

Why is this happening?

FACTS: Deflated beaches and loss of sand due to:

1) Existing development built too close to the shoreline <u>requires protection;</u>
2) Seawalls are built as result of <u>episodic storms</u> (Keonenui Bay, Napili Maui 1980)
3) Seawalls cause cascading effect/domino effect, eliminating natural shorelines;
4) Coastal erosion and Sea Level Rise continue to deflate existing beaches.

Image: County of Maui, Jim Buika


Growing problem: more and more existing shoreline structures are threatened and need protection
http://www.kitv.com/news/hawaii/rocky-point-residents-look-towards-longterm-solutions/23705600

CURRENT PATH: Hawaii's sense of place is being threatened by seawalls and revetments, eliminating sandy shorelines.

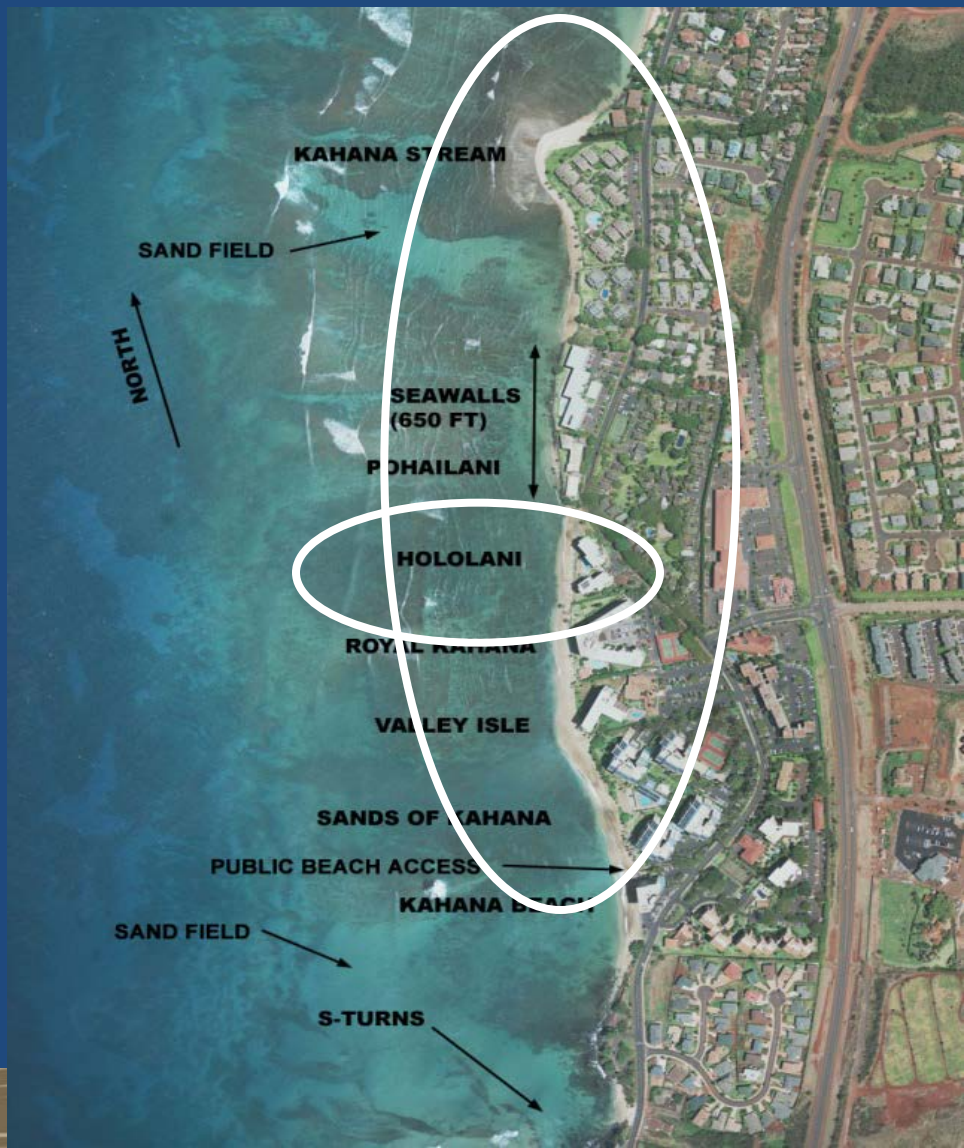
- **Problem: Planners and owners lack cost-effective alternatives**

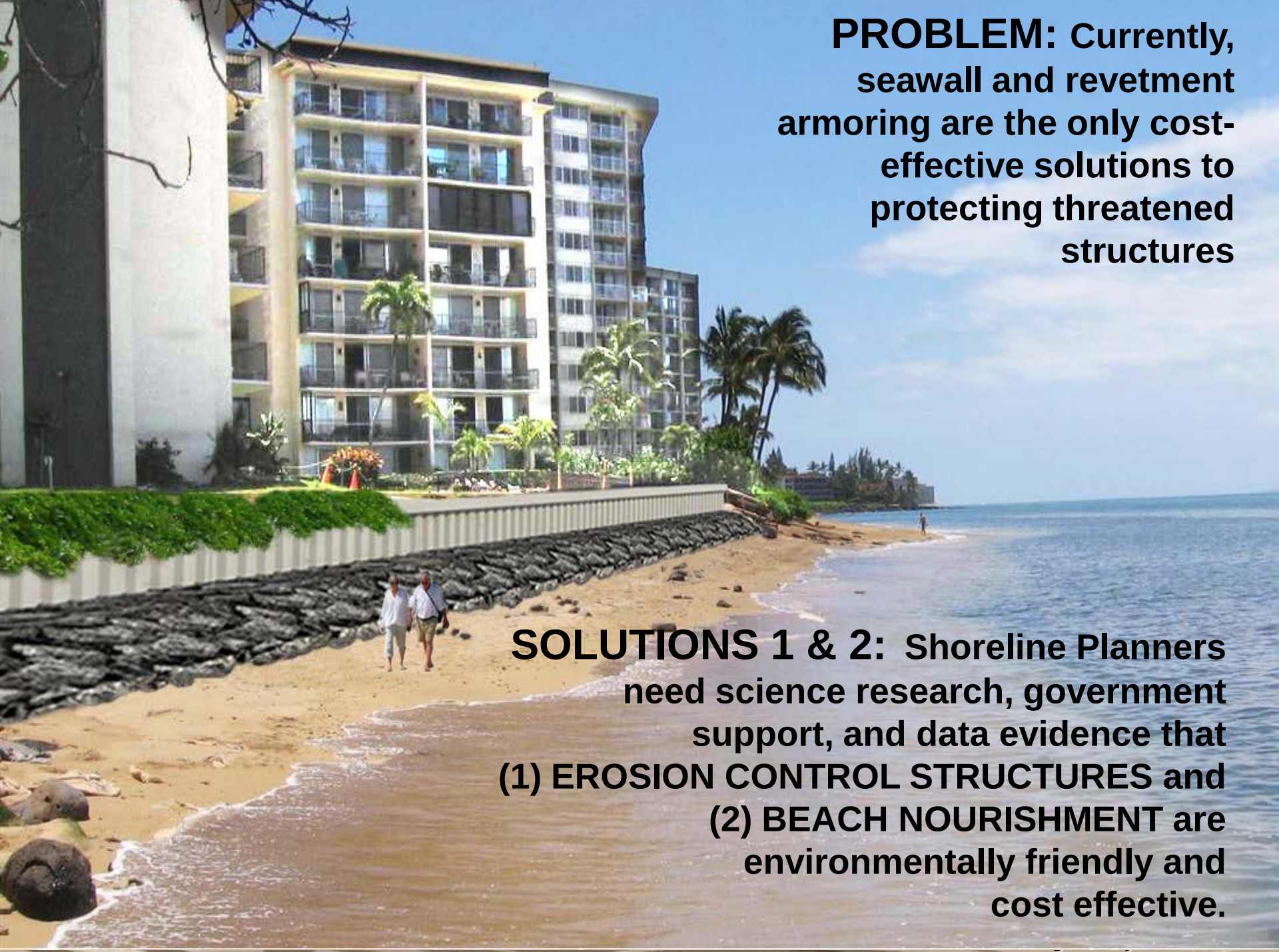
- FACT: Condos, roads, and critical infrastructure, built 30-to-50 years ago, were built too close to the ocean and are now falling into the ocean.

- FACT: We do not have adequate solutions in our tool kit to protect threatened development while preserving the coastal zone.

- FACT: Without research and data to support new laws and policies for additional mitigation tools, Hawaii will lose its sense of place.

- FACT: Our coastal environment is being negatively impacted by our requirements to protect failing development & infrastructure.





PROBLEM: Currently, seawall and revetment armoring are the only cost-effective solutions to protecting threatened structures

SOLUTIONS 1 & 2: Shoreline Planners need science research, government support, and data evidence that (1) EROSION CONTROL STRUCTURES and (2) BEACH NOURISHMENT are environmentally friendly and cost effective.

Solution 1: Three Examples of Structural Alternatives to Seawalls and Revetments.

One is natural and two are man-made.

Ko Olina Lagoon, Kapolei, Oahu, Manmade offshore groin/revetment. A healthy fish and coral ecosystem are forming as a result of the rock structure which preserves a sandy shoreline through wave energy dissipation.
(Photo: J. Buika)

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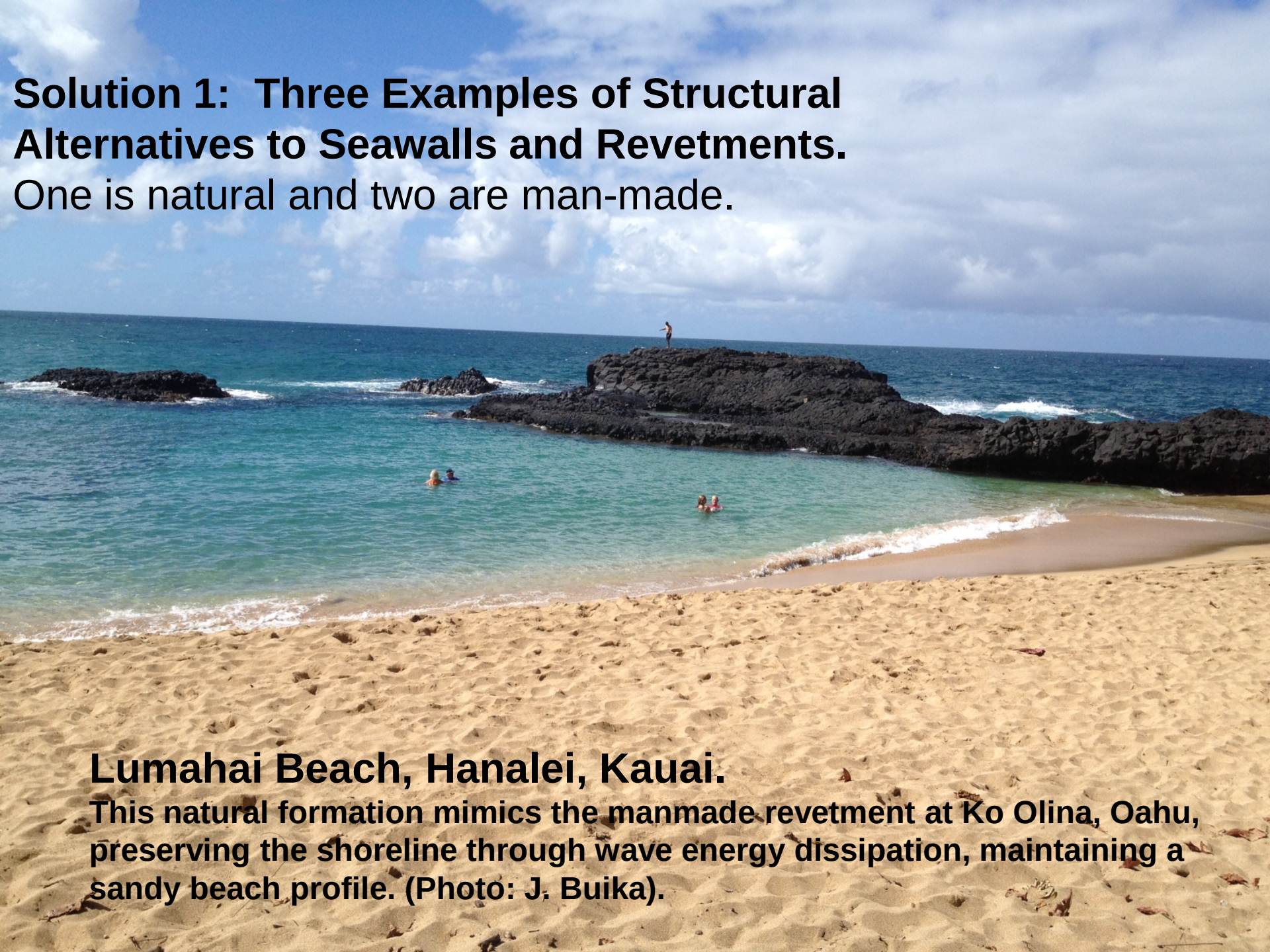

Lumahai Beach, Hanalei, Kauai.
This natural formation mimics the manmade revetment at Ko Olina, Oahu, preserving the shoreline through wave energy dissipation, maintaining a sandy beach profile. (Photo: J. Buika).

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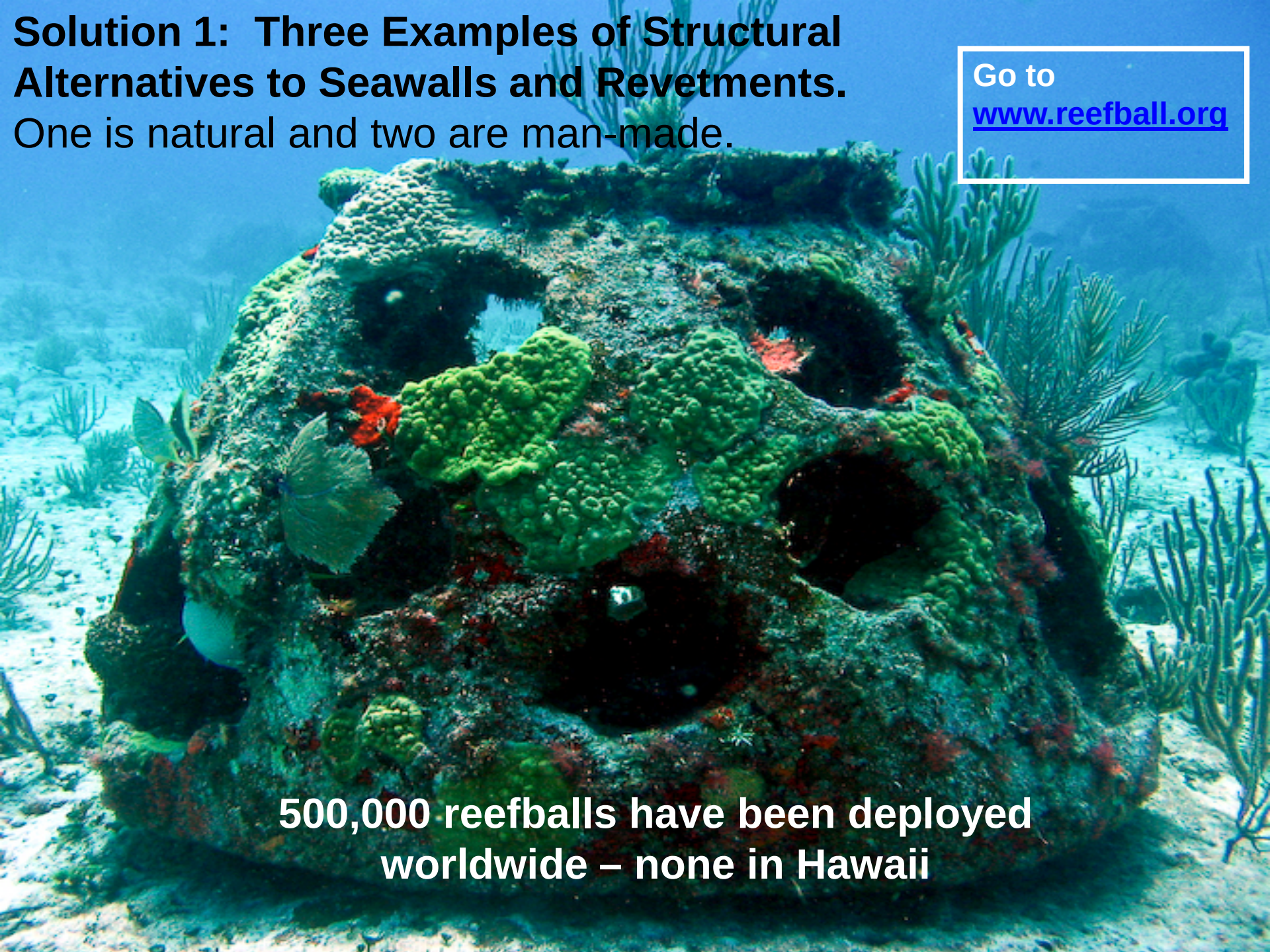
One is natural and two are man-made.

Go to www.reefball.org



500,000 reefballs have been deployed worldwide – none in Hawaii

Solution 1 Conclusion:

Counties require Alternatives to Shoreline Hardening: We need science & data to create additional cost-effective & environmentally friendly options: such as groins, breakwaters and artificial reefs…

Solution 2: Create Additional Cost-effective Options

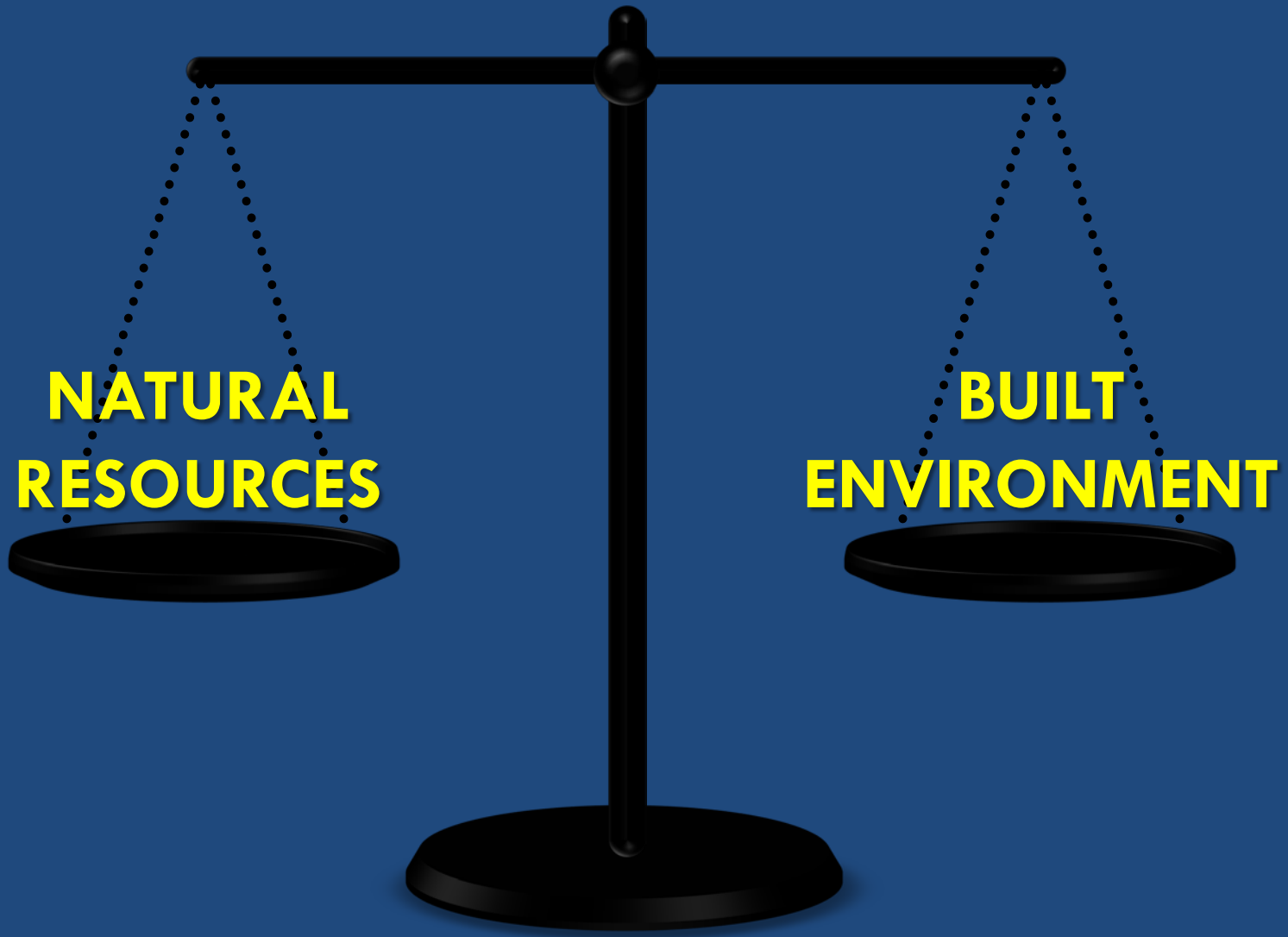
Beach Nourishment

Solution 2: Counties require research & data on environmental benefits and impacts of Beach Nourishment Projects, such as Sugar Cove, North Shore, Maui

Solution 3: Episodic Storms must be planned for NOW… With Scientists and Data Experts

Image: Dolan Eversole, University of Hawai'i Sea Grant College Program

RECONSTRUCTION TRADEOFFS: Without preplanning with communities our remaining beaches may be hardened



RECONSTRUCTION DEBATE

POST-DISASTER RECONSTRUCTION GUIDELINES AND PROTOCOLS

FOR THE CONSERVATION OF COASTAL RESOURCES AND PROTECTION OF COASTAL COMMUNITIES, MAUI COUNTY

James Buika, County of Maui Planning Department
Tara Owens, University of Hawaii Sea Grant
& Cardno TEC Consulting Team
2014

"Building Back Safer, Stronger, Smarter!"

GUIDELINES → PROTOCOLS → STREAMLINED ACTIONS

damage impact

sensitivity

	Damage Impact Type 1	Damage Impact Type 2	Damage Impact Type 3
Shoreline Type 1	guidelines	guidelines	guidelines
Shoreline Type 2	guidelines	guidelines	guidelines
Shoreline Type 3	guidelines	guidelines	guidelines

Fast/Expedited Track

GO: Rebuild
•Follow BMPs

Inspection Track
aka: Plan Review Waiver

WAIT: Inspection Needed

•Assess damage
•Additional BMPs may be required

Normal/Environmental Track
Present Permit Process

STOP: Impacts may be significant

•Environmental or cultural impacts must be mitigated

Public Service Announcement (PSA):
Instructions of the type of actions allowed per community

PSA:
Instructions to photograph, document and report damage & set up inspection date

PSA:
Guidance for following existing permit structure with public review to address environmental issues

DAMAGE TYPE / ENVIRONMENTAL SENSITIVITY	A. INTERIOR BLDG.	B. NON-STRUCT. BLDG.	C. ROOF REPAIR/ REPLACE	D. ACCESSORY OR AMENITY	E. LOSS OF UTILITIES	F. BLDG. REPAIR (<50%)	G. BLDG. FAILURE (>50%)	H. SEAWALL REPAIR	I. LOSS OF BEACH /DUNE WITH REQUEST FOR NEW SEAWALL	J. BLUFF FAILURE WITH REQUEST FOR GRADING OR RETAINING WALL
1. STABLE CLIFF										
2. HARDENED COASTLINE										
3. LOW, ROCKY VOLCANIC										
4. STREAM AND GULCH										
5. ERODIBLE BLUFF										
6. SEASONAL SANDY BEACH										
7. INTERMIT. SANDY BEACH										
8. PEBBLE BEACH										
9. WET-LAND/LOW-LYING										
10. SANDY BEACH										

FAST/ EXPEDITED TRACK

INSPECTION TRACK

NORMAL/ ENVIRONMENTAL TRACK

Bottom line, post-storm, will we be ready to restore the beach or must we harden the shoreline?

Restoring the beach requires research to understand environmental impacts and cost-effective incentives.

Data Needs are related to Processes to *Build Back Safer, Stronger and Smarter*

1. Disaster Declaration Process
2. Inspection Process
3. Best Management Practices
4. Mitigation strategies
5. Adaptive strategies
6. Plan reviews for rebuilding
7. Community priorities
8. Government jurisdictions (3)
9. Alternatives to shoreline hardening

Join us on Maui for the
Hawaii Congress of Planning Officials
Sheraton Black Rock, Ka'anapali
Sept. 10-12 2014, sign up for
Shoreline Tour & Shoreline Sessions

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