

## **RSM in Southeast Oahu: Workshop 2**

Date: June 1, 2005

Time: 9:00 am – 12:00 pm

Location: Waimanalo Public Library

Attendees:

<b>Organization</b>	<b>Participant</b>
BAE Spectral Solutions	Michael Knight, PhD
City & County of Honolulu	Wayne Hashiro
Kailua Bay Advisory Council	Lisa Ferentinos
LIDAR Pacific Corpotation	Brent Pack
Marine Corps Base Hawaii	Dianne Drigot, PhD
NOAA, Pacific Services Center	John Marra
Oceanic Imaging Consultants	Masaomi Uchida
Oceanit	Warren Bucher, PhD
Sea Engineering, Inc.	Scott Sullivan
State of Hawaii, Dept. of Land & Natural Resources	David Smith Morris Atta Sam Lemmo
U.S. Army Corps of Engineers, Engineering Research & Development Center, Coastal & Hydrology Lab	Stan Boc
U.S. Army Corps of Engineers, Honolulu District, Environmental Technical Branch	Cindy Barger
U.S. Army Corps of Engineers, Honolulu District, Civil Works Technical Branch	Jim Pennaz Jessica Hays
U.S. Army Corps of Engineers, Honolulu District, Technical Integration Group	Justin Pummell
U.S. Army Corps of Engineers, Honolulu District, Regulatory Branch	Lolly Silva
U.S. Army Corps of Engineers, Honolulu District, Environmental Technical Branch	Mark Arakaki
U.S. Army Corps of Engineers, Honolulu District, Civil Works Technical Branch	Tom Smith
U.S. Environmental Protection Agency	Wendy Wiltse, PhD
University of Hawaii, Dept. of Geology	Charles "Chip" Fletcher Christopher Bochicchio
University of Hawaii, Sea Grant College Program	Dolan Eversole

### **RSM in Southeast Oahu: Workshop 2 Objective**

The objective of this workshop was to identify alternatives, opportunities, and issues of consideration for the planning and design of the potential demonstration projects. The potential demonstration projects proposed for discussion included:

- Kaopu Beach/Kaiona Beach
- Bellows Air Force Station
- Lanikai Beach
- Ka'elepulu Stream

### **RSM in Southeast Oahu: Workshop 2 Agenda**

<b>TIME</b>	<b>TOPICS</b>	<b>PRESENTER</b>
9:00am - 9:10am	Welcome & Introductions	Sam Lemmo (DLNR)
9:10am - 9:30am	Workshop #1 Findings & Summary	Tom Smith (USACE)
9:30am - 9:50am	Numerical Models	Jessica Hays (USACE)
9:50am - 10:10am	GIS Web Application	Justin Pummell (USACE)
10:10am - 10:30am	Field Investigations	Stan Boc (USACE)
10:30am - 10:45am	Break	
10:45am - 11:45am	Breakout Sessions	All
11:45am - 12:00pm	Summary & Conclusions	Tom Smith (USACE)
12:00pm	Adjourn	

## Workshop #2 - Breakout Session Bellows Air Force Station

### Breakout Sessions Objective

The objective of the breakout session was to discuss and expand, if necessary, the proposed problem statements and identify alternatives, opportunities, and issues of consideration for the planning and design of the potential demonstration projects. Here are the results that the participants came up with. If you would like to add anything to these topics, please feel free to contact us

### Potential Demonstration Project Location

The potential demonstration project is located at the northern most end of Bellows Air Force Station in front of the cottages. The project is approximately 3,000 linear feet



Beach erosion in front of Bellows AFS cottages (March 2004)

### Problem Statement

- Erosion threatening cottages. Shoreline armoring tying up sand supply
  - What is the armoring protecting?
  - Sand supply is the backshore sand
- Down shore area – used for training for Marines. This area is being affected by the sand being tied up behind the armoring. Need to provide “range sustainability” to get military decision-makers on board.

### Issues

- Need to protect lateral access
- Need to add reefs into the models
- Revetment is affected other shorelines nearby
- Streams
- Is there a conflict with military training? Need to ensure training can continue
- Habitat – endangered species in the area such as sea turtles

### Opportunities

- Build partnerships with Marine Corps Base, Air Force Station, National Guard, Navy, City & County of Honolulu, etc.
- AFS pier dump site “installation restoration study”
  - Opportunities for the information from the study to be shared with the RSM team
  - Opportunities for the RSM team to educate the AFS
- Recreate original environment/system in models for analysis
- Perform pilot project on specific areas
- Military recreational and relaxation facility (R&R) – provides incentive to preserve the area
- Ko’olau Poko Watershed – Priority pollution clean up area by EPA/DOH
  - Some small amount of funding possible but unlikely.

### Alternatives

- Move the AFS cottages back
- Let Bellows AFS return to a natural state of sand dunes – DOD owned land
- Move shoreline armoring back
- Streams – are they a sand sink or a sand source?
- Waimanalo jetty remove?
- Sediment builds up in streams
- Recycle sand in front of revetment

## Workshop #2 - Breakout Session Lanikai

### Breakout Sessions Objective

The objective of the breakout session was to discuss and expand, if necessary, the proposed problem statements and identify alternatives, opportunities, and issues of consideration for the planning and design of the potential demonstration projects. Here are the results that the participants came up with. If you would like to add anything to these topics, please feel free to contact us.

### Potential Demonstration Project Location

The potential demonstration project is located along the entire shoreline of the Lanikai community. Shoreline erosion has resulted in the loss dry beach along the southern portions of the Lanikai shoreline. To the north, the beach tends to widen therefore providing a buffer to wave induced impacts to upland development. Almost the entire length of the Lanikai shoreline has been hardened through construction of various types of coastal structure.



Shore protection, Lanikai South

### Problem Statement

- No dry beach exists along the southern shoreline
- The Majority of the shoreline is armored
- Sand loss – 150 ft of beach has been lost overtime in the southern reaches
  - Need to define the goal of restoration – 150' beach or something smaller and more practical.
- Loss of recreational uses & natural beach process
  - Coastal erosion & sediment loss.
- Is the erosion cyclical?
- Walls – built in response to erosion
  - Some additional erosion has occurred after the walls were constructed in some localized areas.
- What are the trends & patterns of shoreline change?
- What factors affect shoreline stability?
- Where does the sand go to and come from?
  - Conduct a sediment budget
- Ongoing shoreline structure inventory is underway.

### Issues

- Potential conflicting uses – shore protection, fisheries, recreation.
- Beach nourishment could impair coral reef systems.
- Invasive species issues = algae, sea grass along shoreline, others?
- Turbidity issues
- Water quality concerns?
- Wall not coming out so alternative shore protection options are limited
  - Lanikai fully armored except for 1 property.
- State encroachment rules may limit shore protection design options.
- Exchange of sand between neighboring cells
  - Is Lanikai a closed cell?
  - Is it an open cell and what other cells is it exchanging sand with?
- Historical assessment: What did the shoreline look like
  - Before the Bellows AFS revetment?
  - After the Bellows AFS revetment?
- Look at strand/dune areas as an “ecosystem” vs. recreational use only.
  - What are the biological benefits of the dune systems?
- Social aspects of design options need to be considered.
- Need to protect lateral access

### Opportunities

- Develop a sediment budget
- Biological zone and structure mapping by NOAA is ongoing
- What is the appropriate scale for demonstration projects?
- 3-d model of wave & current forcing is needed that looks at both the major event as well as the everyday activities.
- Run-up analysis needed – information available from USGS, the Tsunami Center and CDC
- Lanikai beach nourishment project.
- Rainfall and flood event data needed.
- Risk and vulnerability analysis needed to frame alternatives (Economics)
- Beach nourishment conducted at southern end of Lanikai. Small nourishment project that lasted only 6 weeks.
- Storm event assessment needed.
- Develop a “special area management plan” (SAMP) for Lanikai that covers a variety of uses, authorities and participants.
  - SAMPs authorized in the Federal CZMA and related laws (like CWA). Some funding/cost-sharing available on a federal level
  - May offer a funding mechanism through tax zones.
- Pro bono special area plan for recreational uses in Lanikai by the Lanikai Canoe Club.
- Consider Lanikai as a fisheries management area

### Alternatives

- Beaches as ecosystems vs. engineering structures
  - Conduct public outreach and education plan
  - What is the value of the beach?
- Combination of beach fill and hardened structure
  - Create pocket beaches
  - What would the maintenance issues be?
- Develop and implement a comprehensive master plan
  - SAMP or other mechanism
- Create alternative designs where walls need to be fully replaced
  - Goal: minimize future loss of beach area.
- Focus on the science – why or what is going on at Lanikai?
  - Sediment budget analysis

## Workshop #2 - Breakout Session Ka'elepulu Stream

### Breakout Sessions Objective

The objective of the breakout session was to discuss and expand, if necessary, the proposed problem statements and identify alternatives, opportunities, and issues of consideration for the planning and design of the potential demonstration projects. Here are the results that the participants came up with. If you would like to add anything to these topics, please feel free to contact us.

### Potential Demonstration Project Location

The potential demonstration project is located at the mouth of Ka'elepulu Stream in Kailua Bay. Beach sand from either side of the stream along with terrestrial sediments converge at the mouth of the stream and impede navigation, stagnate flow and degrade water quality. To the south, the beach narrows at the boat ramp and terminates at the adjacent headland (Alala Point). North of the stream, the beach is relatively wide and advancing oceanward as evidenced by the vegetated backshore.



Mouth of Ka'elepulu Stream

### Problem Statement

- Sand removed from system by stream maintenance
- Sand stockpiled on stream banks
- Sand blown inland by tradewinds & out of system
  - May be only temporarily out of the system – small amount.
- Sand management of Kailua Beach Park needs to consider all of Kailua Beach.
- One of the few natural beach systems – need to maintain
- Water quality – mouth/berm is a natural filter for upland water quality.
  - Mangrove control issues

### Issues

- How much of a buffer of sand is needed
- Storm events and plug removal result in water quality issues
- Natural vs. urban river systems
  - What do they look like?
  - Natural systems are often suppose to appear “dirty”
- Enchanted lakes – no dredging has occurred there. There are contamination issues in the lakes.
  - How does this fall into the watershed study and management of Ka'elepulu?

### Opportunities

- UH did shoreline erosion study for Kailua in 2000 and is currently updating it.
- Keep natural beach and see what can be learned at applied to other areas.
- Kawainui marsh – If Corps management is resulting problems then there is a funding source for the mitigation.
- Use as a sand source for beach nourishment activities
- Previous bypass in 2000 was 10-12,000 cy. No effect on Kailua Beach Park. Temporary beach a length of 500-600 lf lasted for 6 mos.
- DOH is doing TMDL water quality study for the watershed
- Dune management plan
  - Why is the beach stable and how do we keep it stable
- How are Kailua and Lanikai beaches interacting?

### Alternatives

- Develop & Implement a Dune Management Plan
- Backpass material if we know where the material should go
  - Boat ramp?
  - Lanikai?
  - Place back into the North transport channel during the right conditions.
- Stockpile and use the material for individual erosion events as needed
- Restore the natural stream flows so that the channel flushes itself out
- Restore the Kawainui Marsh natural drainage patterns
- Develop & implement a watershed study

## Workshop #2 - Breakout Session Kaupo Beach/Kaiona Beach

### Breakout Sessions Objective

The objective of the breakout session was to discuss and expand, if necessary, the proposed problem statements and identify alternatives, opportunities, and issues of consideration for the planning and design of the potential demonstration projects. Here are the results that the participants came up with. If you would like to add anything to these topics, please feel free to contact us.

### Potential Demonstration Project Location

Kaupo Beach is located south of the Makai Research pier. The length of the potential demonstration project area is approximately 1,500 feet. Kaiona Beach is located north of the pier and the problem area is also approximately 1,500 feet in length. These two narrow beaches front Kalia Highway and provide only minimal protection against wave induced impacts to the road and adjacent upland development. To the south of Kaupo Beach, a rocky headland extends out into Waimanalo Bay and provide coastal storm damage protection to the highway. North of Kaiona Beach, the highway turns mauka of the shoreline and out of harms way. Between the two problem areas, the shoreline is sheltered for wave energy by Rabbit island and a wide shallow reef system.



Erosion at the north end of Kaupo Beach

### Problem Statement

- Erosion is threatening Kalia Highway
  - Approximately 500-800 lf
- Beaches are narrow & unstable
- Erosion is undermining the highway.
- What are the effects of the pier & breakwater?
- What is the effect of the entrance channel (aka- near shore bathymetry of area)?
- What are the effects of the beach rock shelf?

### Issues

- High recreational use
- Increasing traffic volume, sole access around Southeast Oahu
- Usage: fishing, surfing, windsurf, beach goers
- Freshwater seepage
  - Drainage under highway
  - Is it exacerbating shoreline erosion?
- Hawaiian homelands on the mauka side of the highway

### Opportunities

- HDOT work – report completed by E. Noda & Associates
  - Good background information, need to acquire this report
  - Plan was to widen the road
- Detailed wave models can be used to determine changes in wave patterns with different structural solution “what-ifs”
- Possibility of developing site-specific sediment budget
- Impact from rock fall?
- DOH designated area for priority pollution control

### Alternatives

- Groin in the area to trap sediment
  - What would be the effects on the surrounding areas?
- Groin and beach fill
  - What would be the effects on the surrounding areas?
- Bank protection at the toe
- Abandon road and implement a ferry system
- Elevate the road on piling over the beach and water
  - Allow erosion to continue and to find an equilibrium on its own
- Move the road inland and create another tunnel
- Minor relocation of the road inland.
- Offshore breakwater
  - What would be the effects on the surf?