



Southeast Oahu Regional Sediment Management



Southeast Oahu

Regional Sediment Management



WORKSHOP #4

August 27, 2008

Koolau Golf Club
Kaneohe, HI

co-sponsored by:

State of Hawaii Department of Land and Natural Resources

US Army Corps of Engineers, Honolulu District



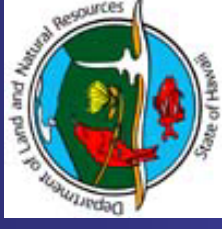
Topics

- **Field Data Collection**
- **Wave and Current Modeling**
- **Shoreline Change Analysis**
- **Sediment Sources and Pathways**
- **Regional Sediment Budget**
- **Potential Demonstration Projects**
- **Future Work**





Agenda



1300 - 1315	Welcome and Introductions	Lemmo
1315 - 1330	Southeast Oahu Regional Sediment Management Overview	Tom Smith
1330 - 1430	Field Investigations	
	Wave and Current Data Collection	Podoski
	Shoreline Change Analysis	Romine
	Offshore Sand Sources	Bochicchio
	Sediment Trend Analysis	Bochicchio
1430 - 1445	Break	
1445 - 1545	Numerical Modeling Results	
	Water Circulation	Podoski
	Wave Transformation	Podoski
	Regional Sediment Budget	Tom Smith
1545 - 1600	Break	
1600 - 1745	SEO/Regional Sediment Management Focus Areas	
	Kaupo and Kaiona Beaches	Tom Smith
	Ka'elepulu Stream	Fletcher
	Bellows Air Force Station	David Smith
	Lanikai Beach Nourishment	David Smith
1745 - 1800	Future Regional Sediment Management Work	Tom Smith
1800	Adjourn	



REGIONAL SEDIMENT MANAGEMENT

An integrated approach that takes a holistic view of coastal, estuary, and river sediments on a regional scale in the planning and maintenance of water resource projects to achieve balanced and sustainable systems.






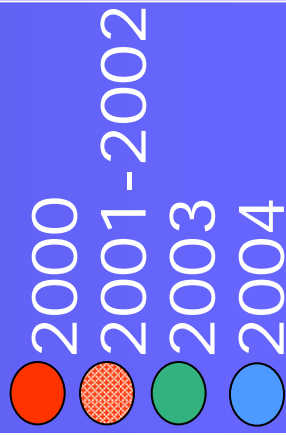
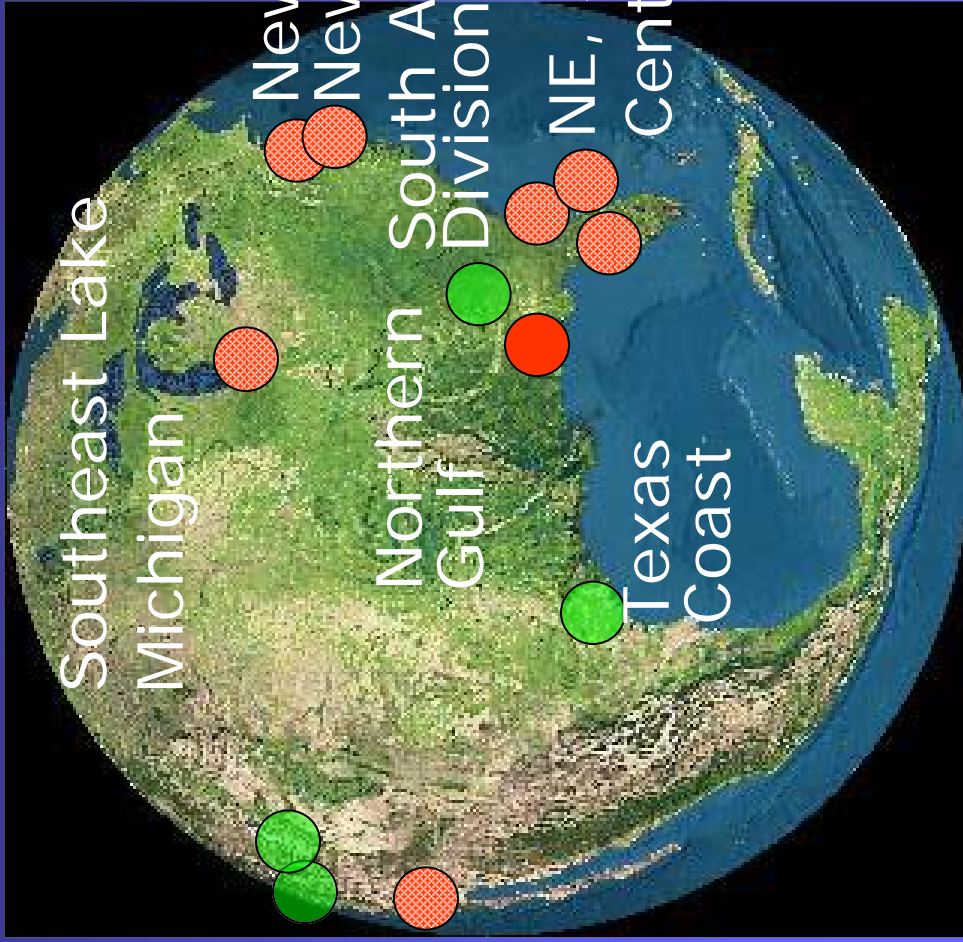
National RSM Demonstration Program



Upper &
Mouth of
Columbia
River

Southern
California

 Southeast
Oahu, Hawaii



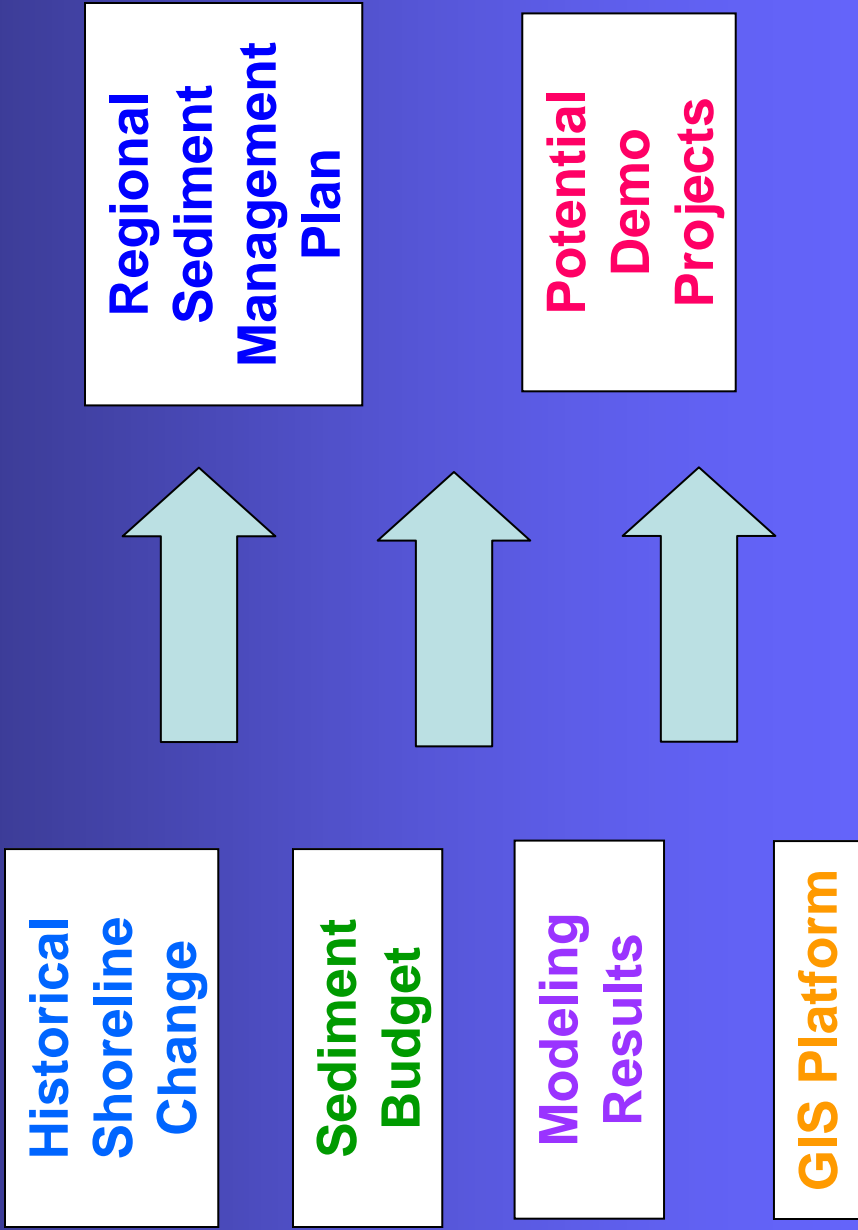


Southeast Oahu RSM Demonstration Project Area

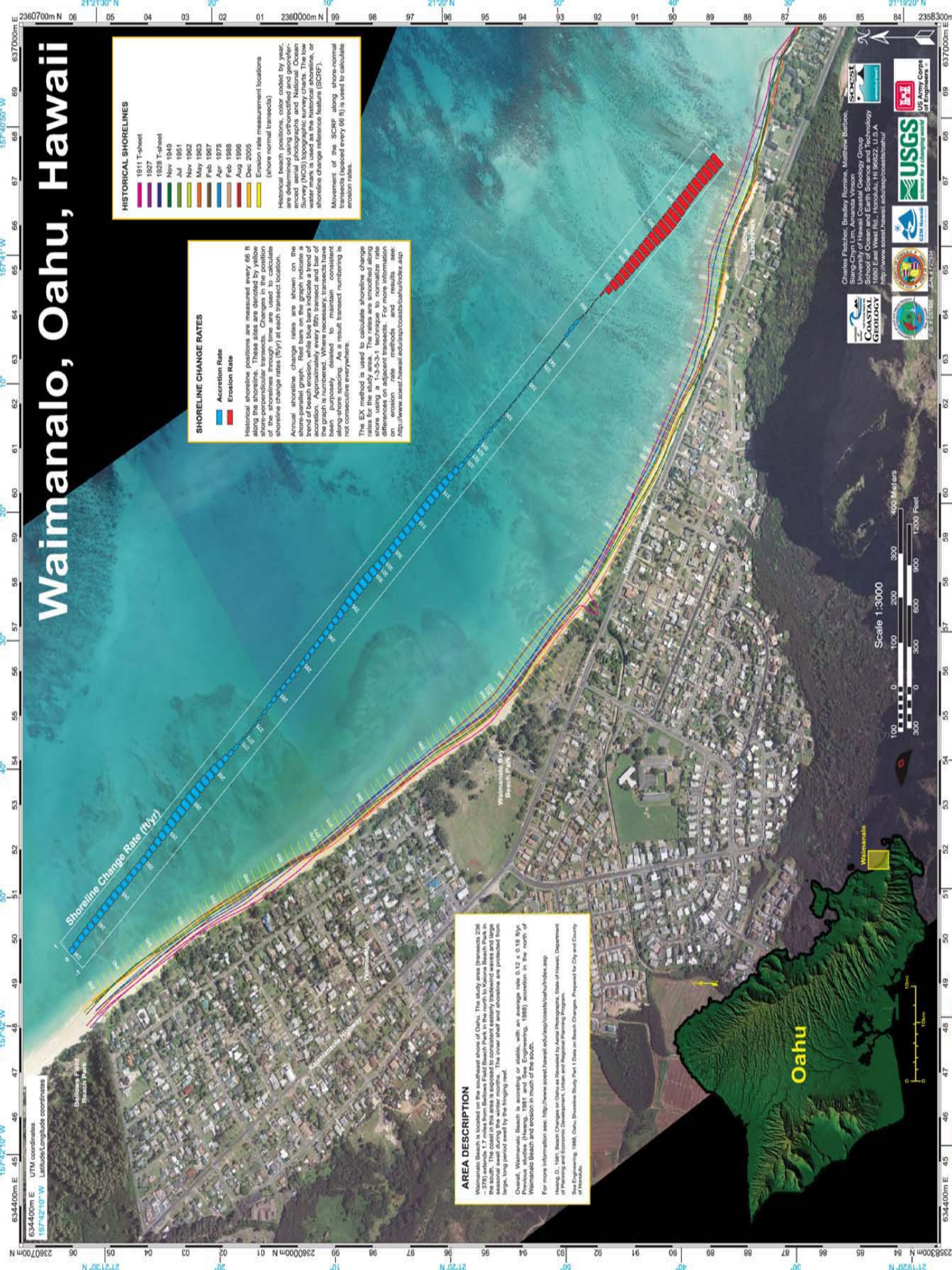




FINAL PRODUCTS



Waimanalo, Oahu, Hawaii



HISTORICAL SHORELINES

- 1911 T-sheet
- 1927 T-sheet
- 1928 T-sheet
- Nov 1949
- Jul 1951
- Nov 1962
- May 1963
- Feb 1967
- Apr 1975
- Feb 1988
- Aug 1996
- Dec 2005
- Erosion rate measurement locations (shore normal transects)

Historical beach positions, color coded by year, are determined using orthorectified and georeferenced aerial photography and the National Oceanic and Atmospheric Administration's Survey (NACS) topographic survey charts. The low water mark is used as the historical shoreline, or shoreline change reference feature (SCRF). Movement of the SCRF along shore-normal transects (spaced every 66 ft) is used to calculate erosion rates.

SHORELINE CHANGE RATES

- Accretion Rate
- Erosion Rate

Historical shoreline positions are measured every 66 ft along the shore-normal transects. The distance between adjacent transects is 66 ft. The difference in the shoreline positions through time are used to calculate shoreline change rates (SCCR) at each transect location. Annual shoreline change rates are shown on the shore-parallel graph. Red bars on the graph indicate a trend of beach erosion, while blue bars indicate a trend of beach accretion. Different colored bars indicate that the graph is numbered. Where necessary, transects have been purposely deiced to maintain consistent transect numbering. The result transect numbering is not consecutive everywhere.

The EX method is used to calculate shoreline change rates using a 1,3-5-5-1 technique to normalize rate differences on adjacent transects. For more information on the EX method, visit <http://www.soest.hawaii.edu/soest/soest/soest/index.asp>.

AREA DESCRIPTION

This study area is located on the west coast of Oahu. The study area extends 250 to 375 meters from Balowes Field Beach Park to the north to Alowes Beach Park to the south. The coast in this area is exposed to consistent easterly trade winds and large waves. The area is characterized by a wide beach and dunes. The area is protected from large, long period swell by the fringing reef.

Oahu, Waimanalo Beach is accretion of sands, with an average rate of 0.12 to 0.18 ft/yr. Previous studies (Huang, 1981 and Sene, Engineering, 1980) accretion in the north of Waimanalo Beach and erosion in much of the south.

For more information see: <http://www.soest.hawaii.edu/soest/soest/index.asp>
 Huang, D., 1981, Beach Changes on Oahu as Revealed by Aerial Photographs, State of Hawaii, Department of Planning and Economic Development, Urban and Regional Planning Program.
 Sene Engineering, 1980, Oahu Beaches Study Part 1 Data on Beach Changes. Prepared for City and County of Honolulu.

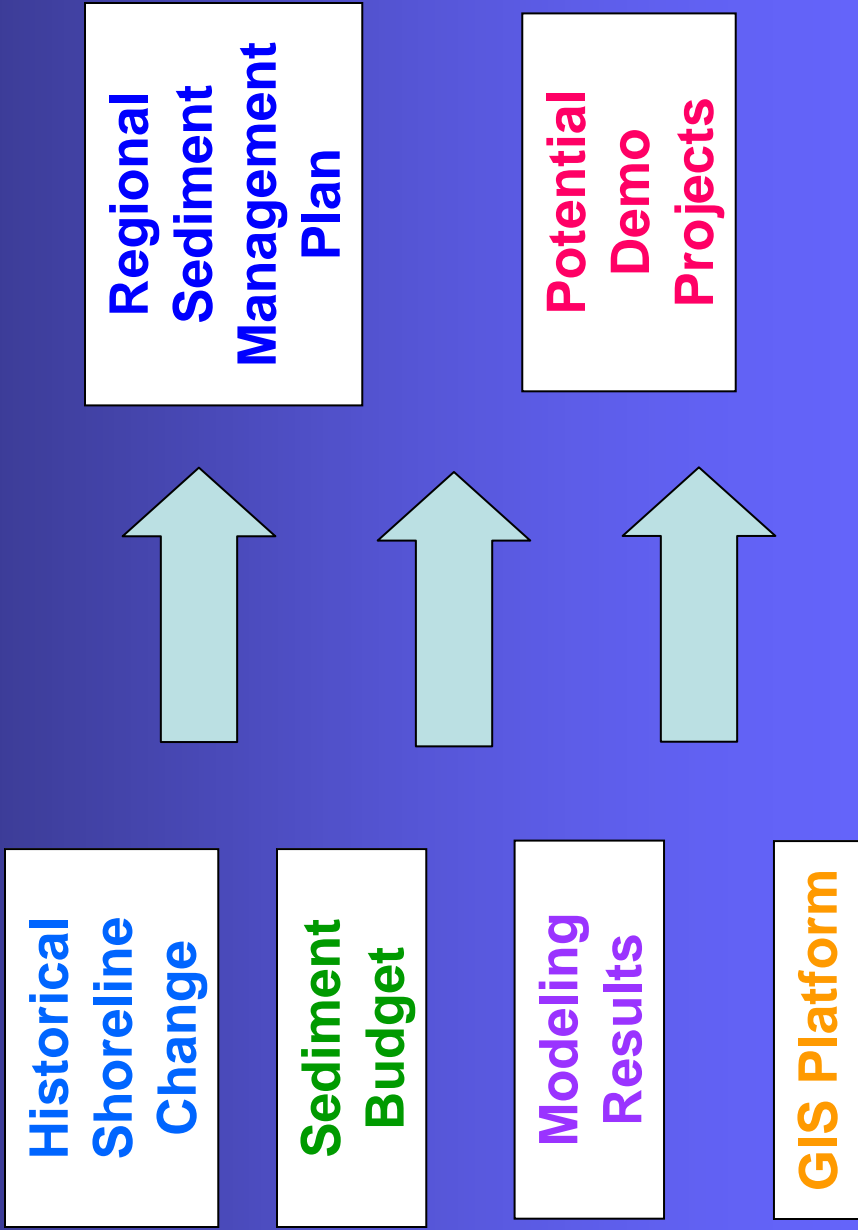
Scale 1:3000

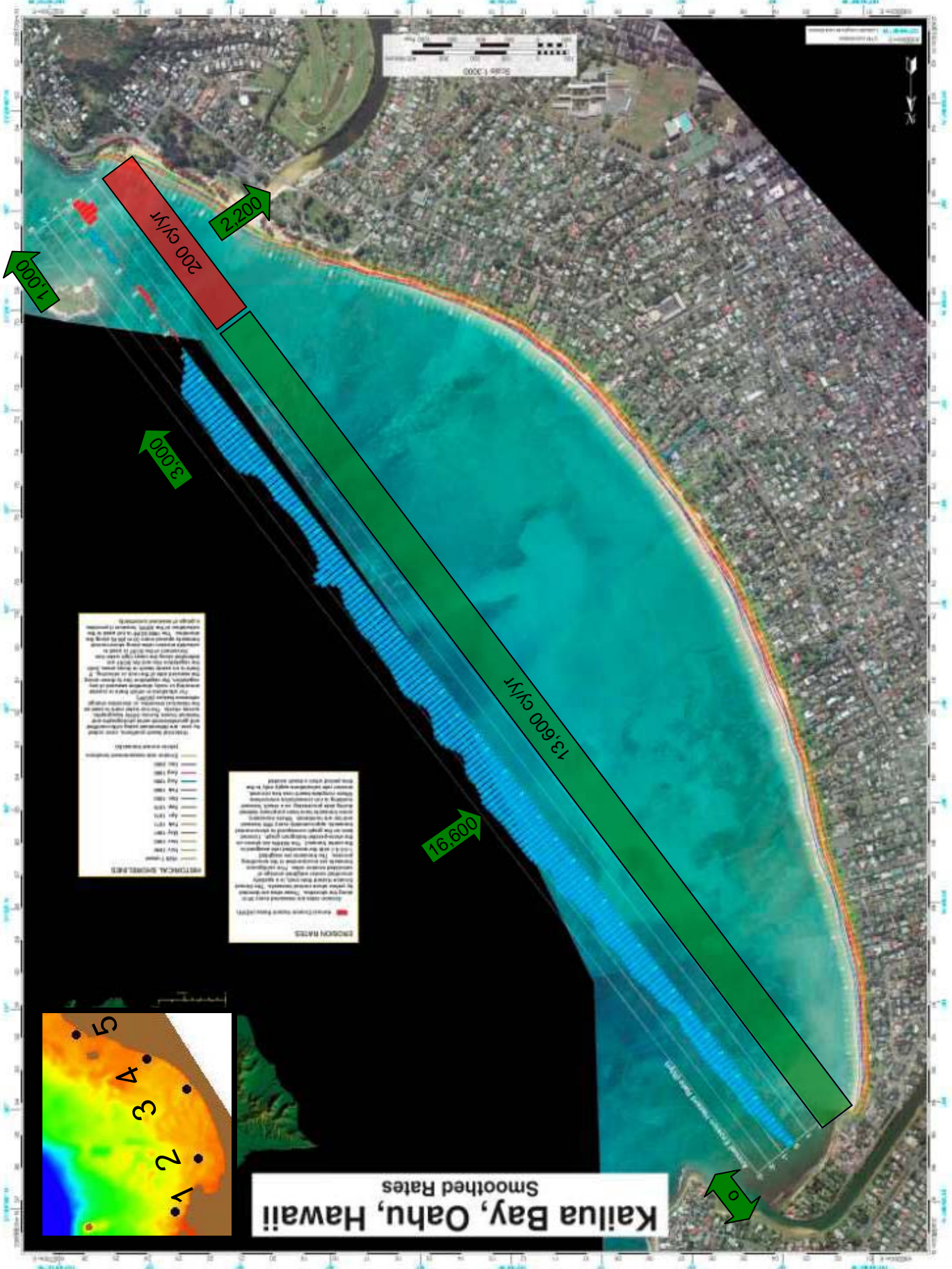


Charles Fletcher, Buckley Rowles, Matthew Barber,
 Shing-Chyn Lim, Amanda Vinson
 University of Hawaii Coastal Geology Group
 1550 East-West Road, Honolulu, HI 96822, U.S.A.
<http://www.soest.hawaii.edu/uahg/coastalgeology/>



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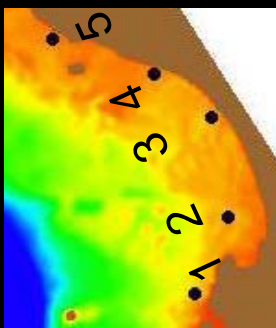


0 50 100
 METERS
 00001 00025

SMOOTHED RATES
 10000
 8000
 6000
 4000
 2000
 0
 -2000
 -4000
 -6000
 -8000
 -10000

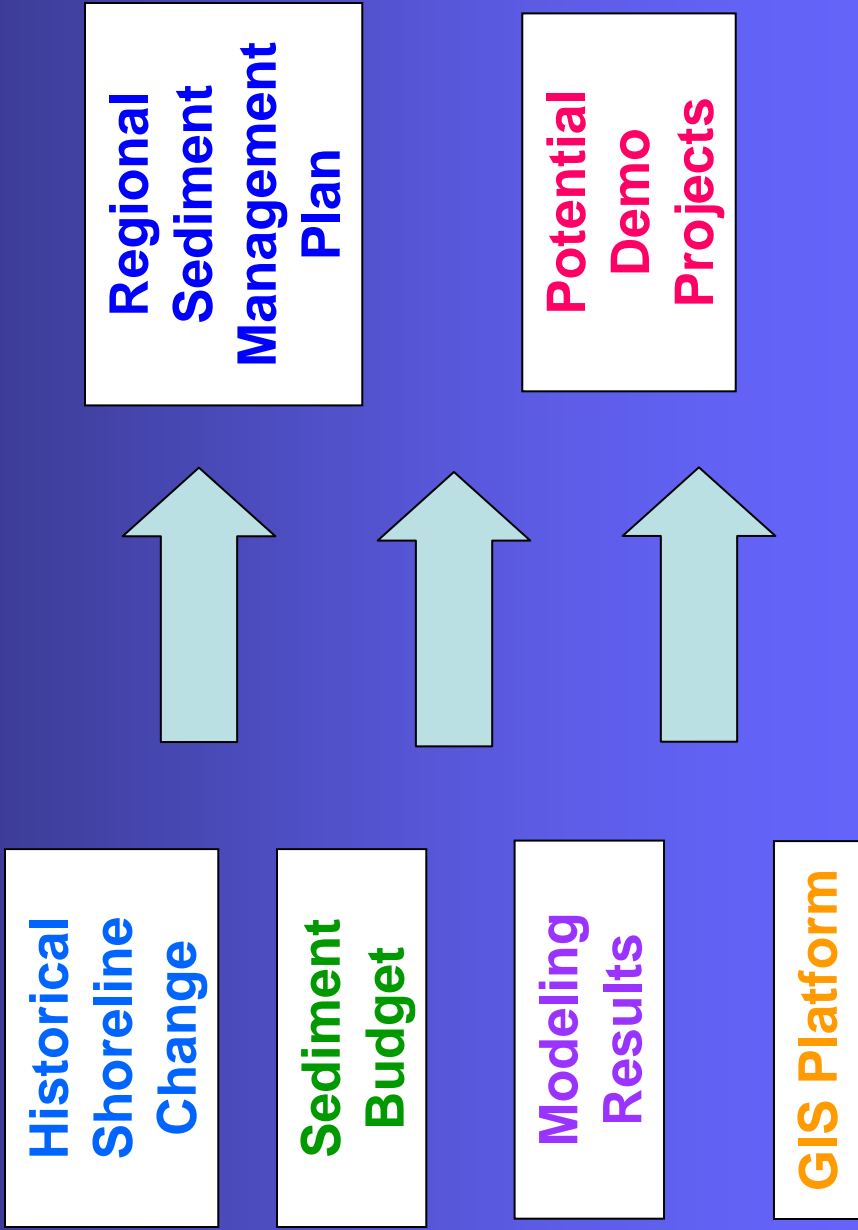
SMOOTHED RATES
 10000
 8000
 6000
 4000
 2000
 0
 -2000
 -4000
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 -8000
 -10000

Kailua Bay, Oahu, Hawaii
 Smoothed Rates





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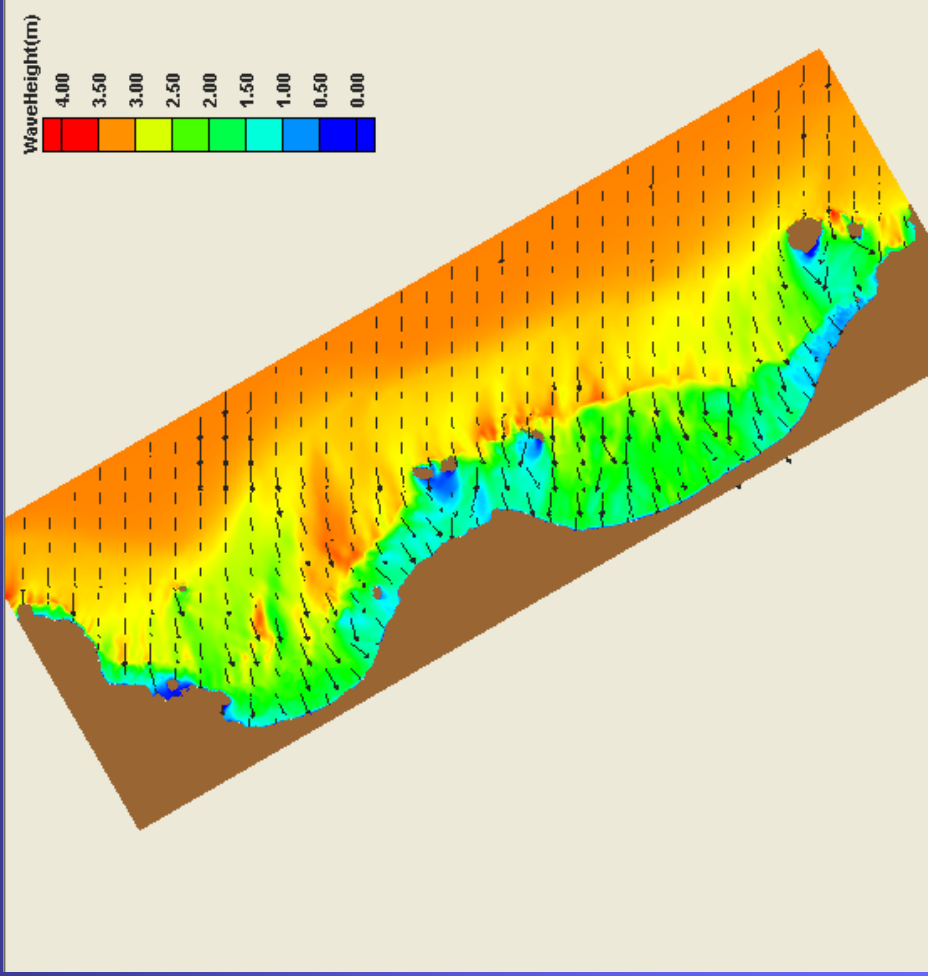




Wave Model Output

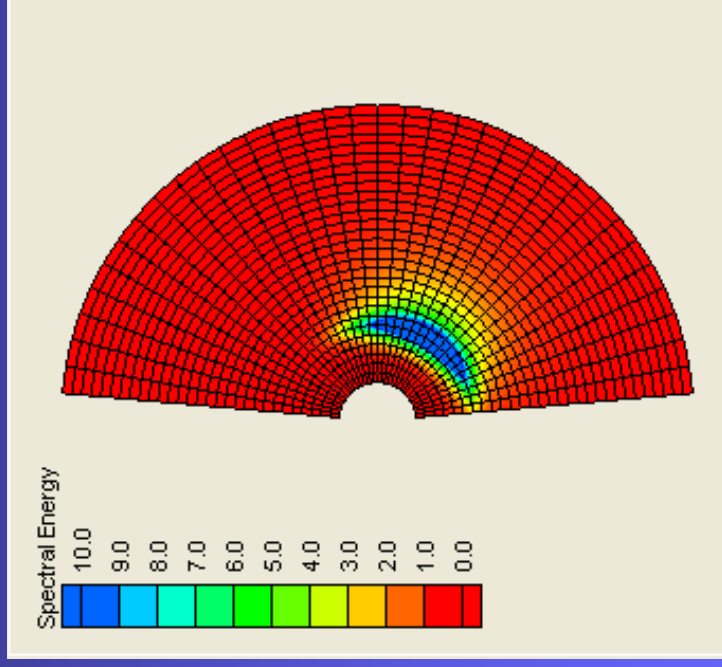


Wave Height and Direction



Spectral Wave Energy

Input (m^2/Hz)



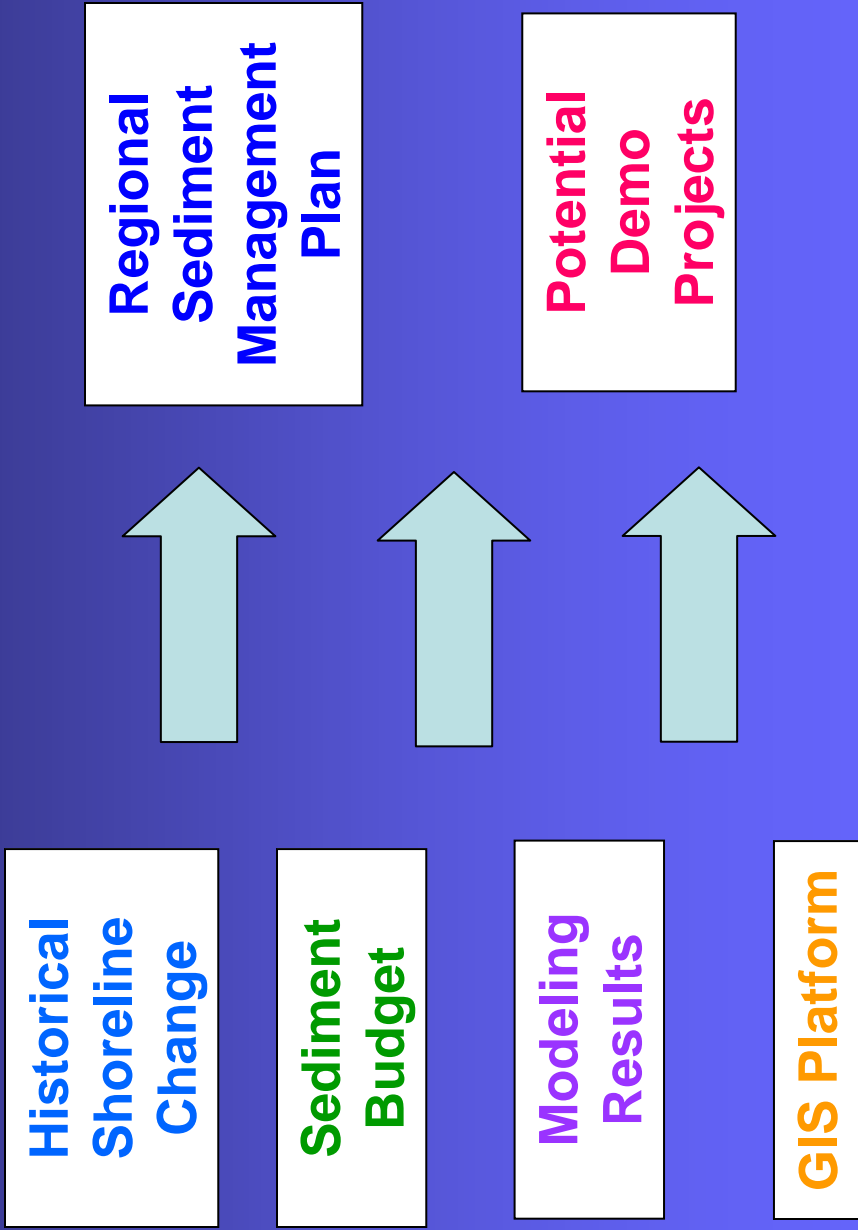
Wave Parameters:

$H_s = 3.5 \text{ m}$

$T_p = 16 \text{ s}$



FINAL PRODUCTS





**US Army Corps
of Engineers®**

HAWAII REGIONAL SEDIMENT MANAGEMENT

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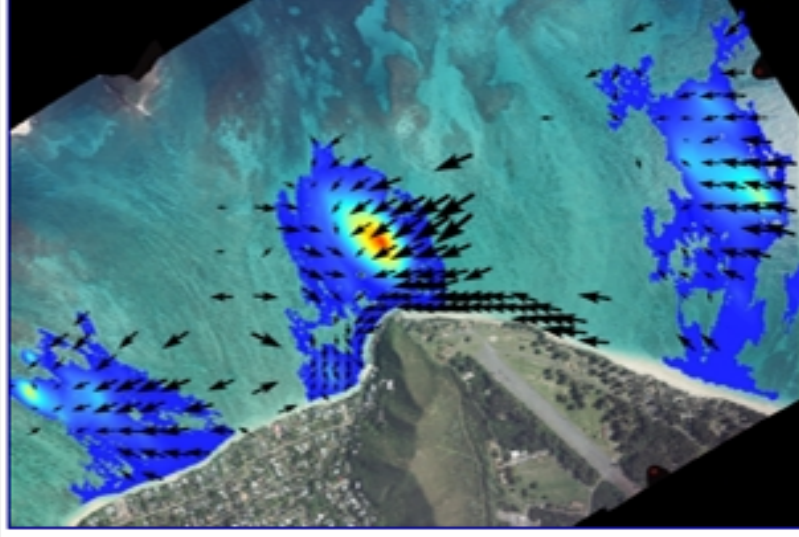
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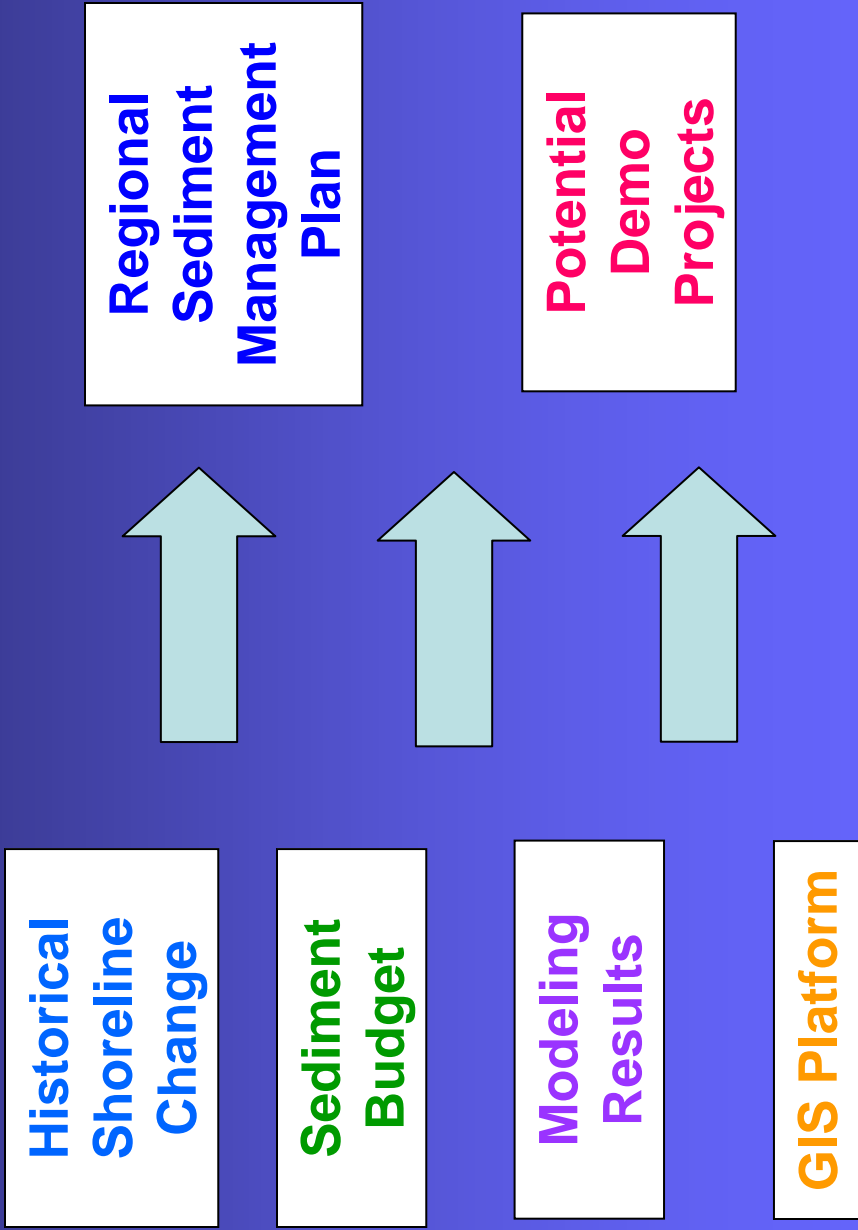
Welcome to the U.S. Army Corps of Engineers, Honolulu District, Regional Sediment Management web site. Herein, you will find an abundant amount of information related to the Honolulu District's efforts on managing one of Hawaii's most valuable assets...sand. Studying the islands from mauka (mountains) to makai (ocean), the Honolulu District and its partners hope to gain a better understanding of sediment transport, and improve upon how it is managed. Please use the links to the left and above to navigate to your desired location.

[>>>HOT NEWS](#)





FINAL PRODUCTS





**SOUTHEAST OAHU
REGIONAL SEDIMENT MANAGEMENT
DEMONSTRATION PROJECT**

REGIONAL SEDIMENT MANAGEMENT PLAN

Prepared for:
U.S. Army Corps of Engineers
Honolulu District
and
State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands

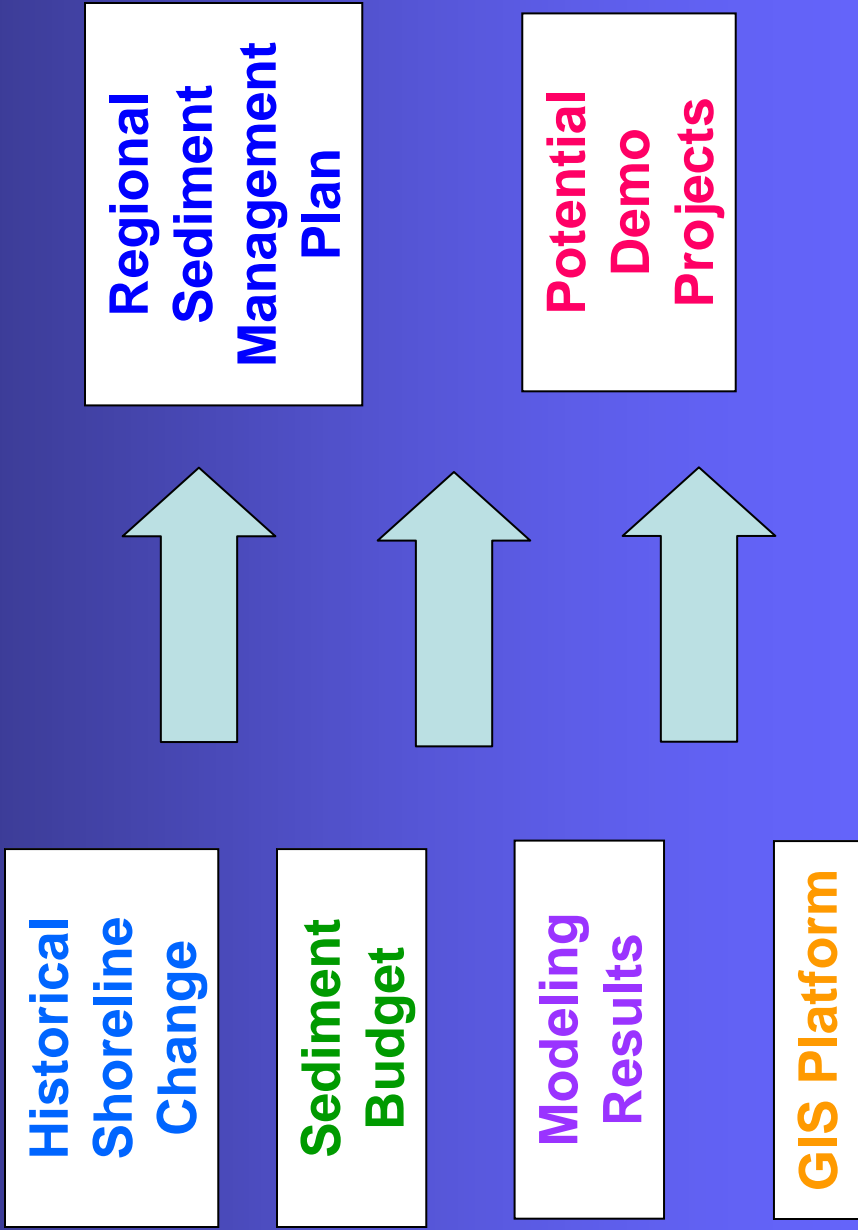
Prepared by:
Oceanit Laboratories, Inc.

December 30, 2006





FINAL PRODUCTS





Potential Demonstration Projects



- **Kaupo & Kaiona Beaches**
- **Ka'elepulu Stream**
- **Bellows Air Force Station**
- **Lanikai Beach**



Kaiona Beach



Kaupo Beach

Kaupo & Kaiona Beaches



Ka'elepulu stream looking makai



Ka'elepulu stream looking mauka

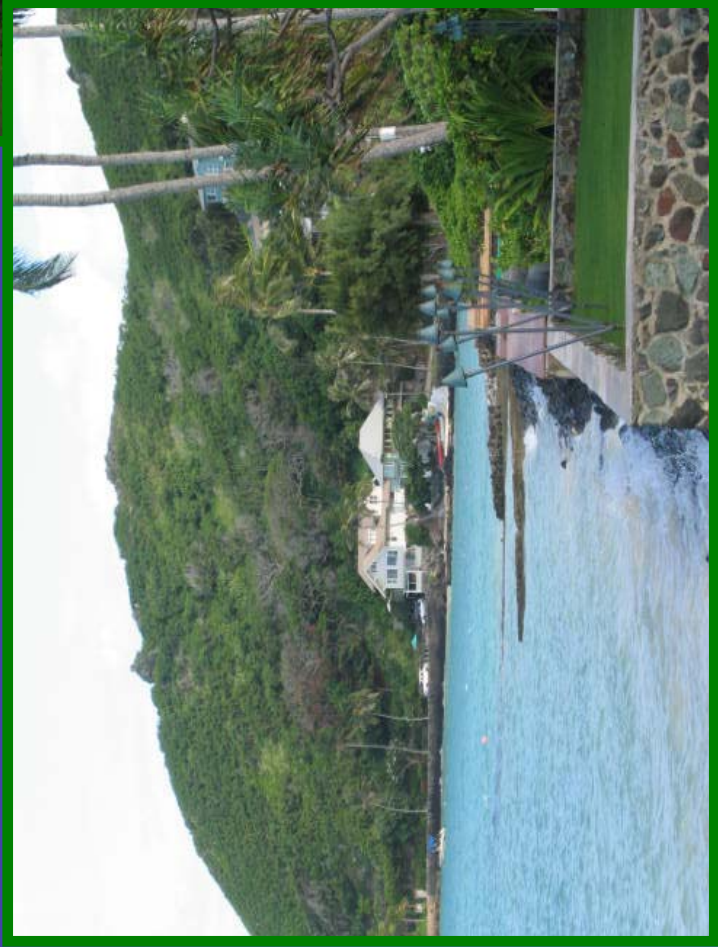
Ka'elepulu Stream



Bellows Air Force Station



Lanikai Beach looking north



Lanikai Beach looking south

Lanikai Beach



Photographs



Makapu'u Beach



September 2005



January 2008



Sea Life Park Water Intake



September 2005



January 2008



Cockroach Bay



September 2005



January 2008



Kaupo Beach



September 2005



January 2008



Kaiona Beach



September 2005



January 2008



Waimanalo Beach



September 2005



January 2008



Bellow Air Force Station



September 2005



January 2008



Bellow Air Force Staion



September 2005



January 2008



Lanikai Beach



September 2005



January 2008



Lanikai Beach



September 2005



January 2008



Lanikai Beach



September 2005



January 2008



Kailua Boat Ramp



September 2005



January 2008



Kailua Beach



September 2005



January 2008



Kailua Beach



September 2005



January 2008



Kailua Beach



September 2005



January 2008



Marine Corps Base Hawaii



September 2005



January 2008



Marine Corps Base Hawaii



September 2005



January 2008



THANKS!

September 2005

January 2008