

# HAWAII REGIONAL SEDIMENT MANAGEMENT

## Sunset Beach RSM Workshop September 18, 2015

Sunset Beach Recreation Center  
North Shore, Oahu



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# AGENDA

0930 - 0945	Welcome and Introductions	Lemmo Shimabuku
0945 - 1000	Regional Sediment Management Overview	Smith
1000 - 1045	Sunset Beach RSM Investigations	
	Shoreline Change	
	Historic	Smith
	Seasonal	Podoski
	Coastal Data Collection	Walker
1045 - 1100	Break	
1100 - 1115	Coastal Modeling	Podoski
1115 - 1130	Potential RSM Actions	Smith
1130 - 1300	Lunch (on your own)	
1300 - 1350	Group Discussion	Smith
1350 - 1400	Site Visit Briefing	Romine
1400 - 1500	Site Visit to Sunset Beach	All

Website: <http://rsm.usace.army.mil/Hawaii/>



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# USACE REGIONAL SEDIMENT MANAGEMENT PROGRAM

Tom Smith  
Honolulu District



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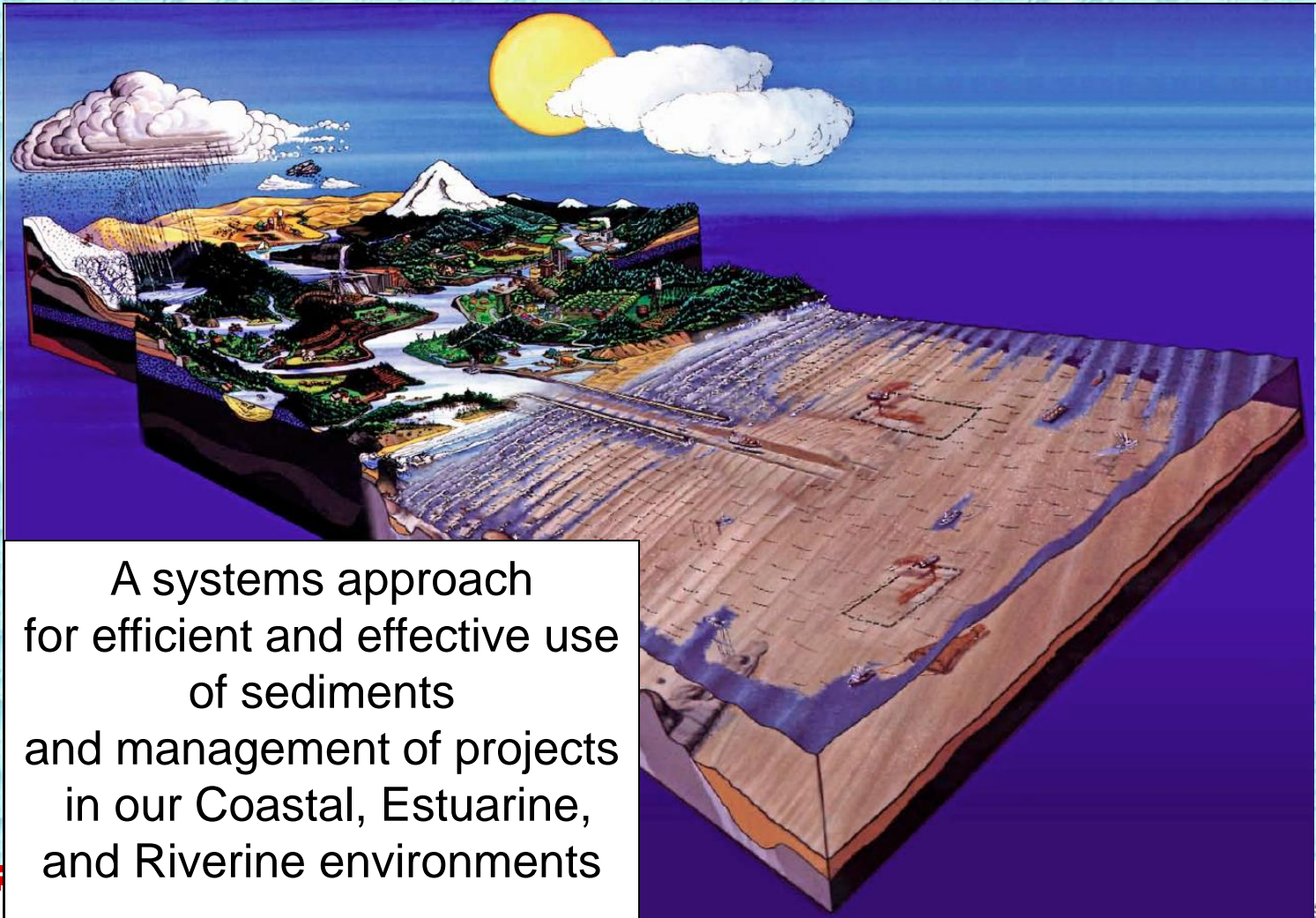
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# Regional Sediment Management



A systems approach  
for efficient and effective use  
of sediments  
and management of projects  
in our Coastal, Estuarine,  
and Riverine environments



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# Why Regional Sediment Management?



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# RSM = Sustainable Solutions for.....

## Navigation/ Dredging



## Flood Risk Management



## Environmental Restoration



## RSM Operating Principles

- Recognize sediment as a regional resource
- Balanced, economically viable, environmentally sustainable solutions
- Improve economic performance by linking multiple projects
- Optimize operational efficiencies & natural exchange of sediments
- Consider local & regional impacts (physical, environmental, social )
- Apply/develop technology & tools to optimize system
- Share information & data, reduce data duplication
- Coordinate/Collaborate/Leverage with stakeholders & partners

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# Historical RSM Participation (2000-2015)



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**25 Districts, R&D**  
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# CASE STUDIES



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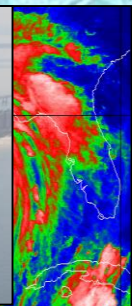
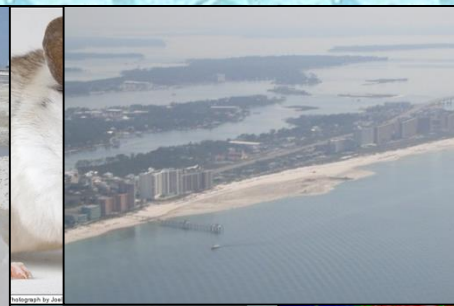
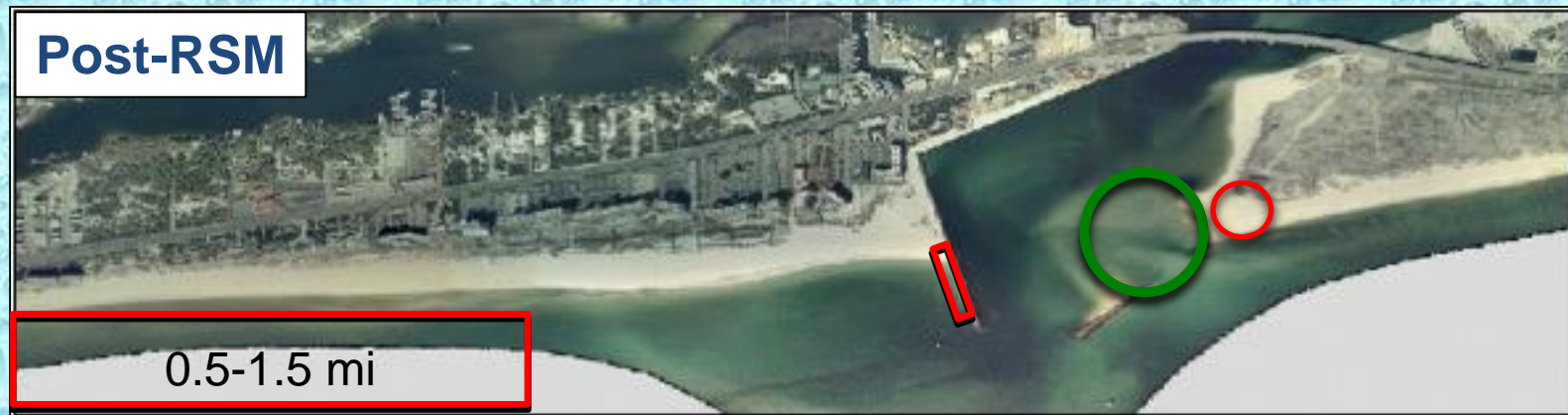
8/30





# Perdido Pass, Alabama

## Optimize Sand Bypassing



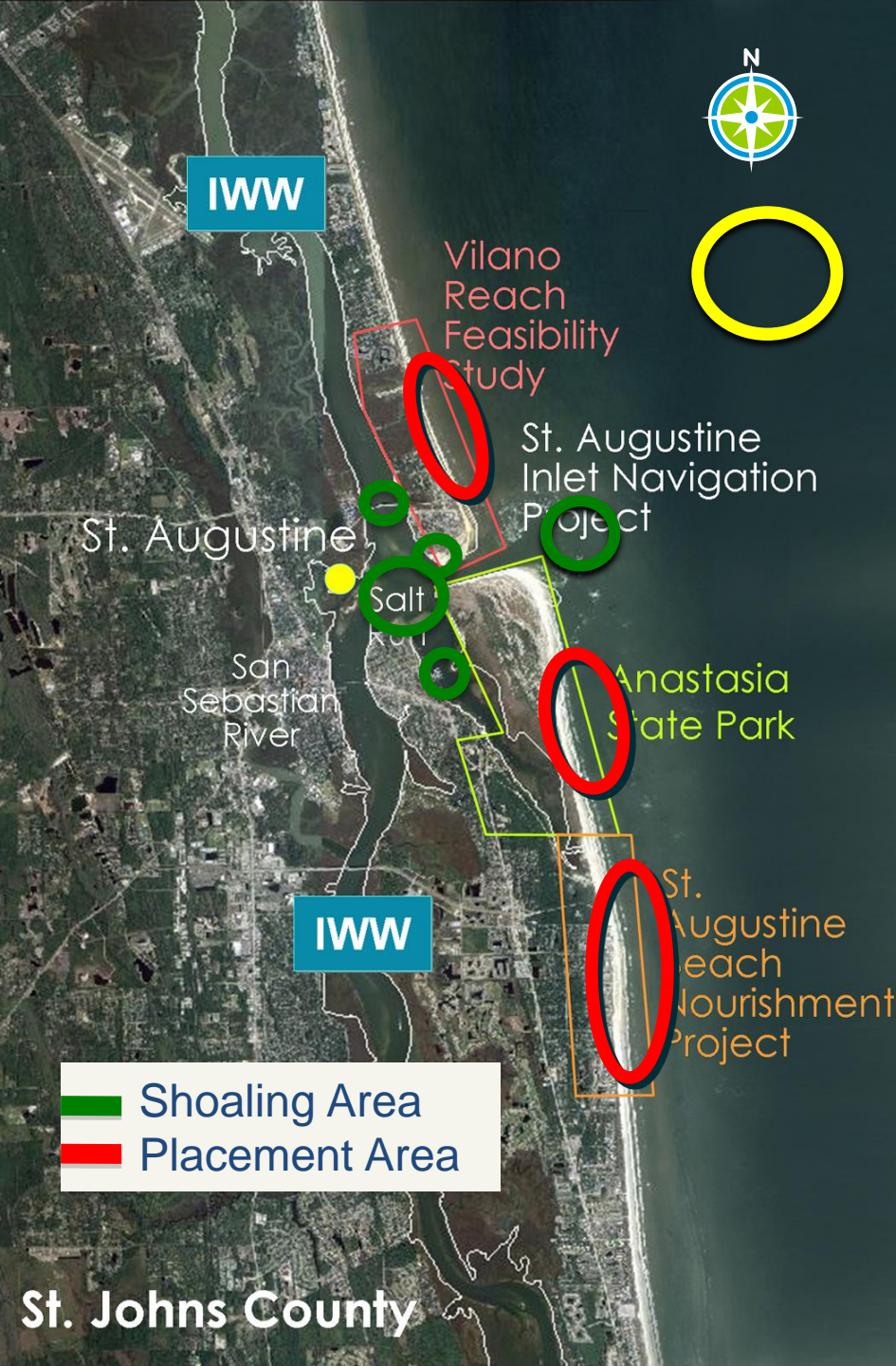
# Jacksonville District St. Johns Co. RSM

## Benefits

- ✓ Combined O&M and SPP projects
- ✓ \$5-7 million savings for dredge mob/demob
- ✓ Lower risk of environmental impact with less dredging,
- ✓ Combined permits,
- ✓ Established new back-up sand sources for emergency nourishments

- **Intracoastal Waterway (IWW)**
- **San Sebastian River**
- **St. Augustine Inlet**
- **St. Augustine Beach SPP**
- **Vilano Beach (Feasibility Study)**
- **Anastasia State Park**

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# FY13 HALEIWA RSM

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HAWAII REGIONAL SEDIMENT MANAGEMENT  
HALEIWA REGION

PUENA POINT BEACH

HALEIWA BEACH

HALEIWA SMALL BOAT HARBOR

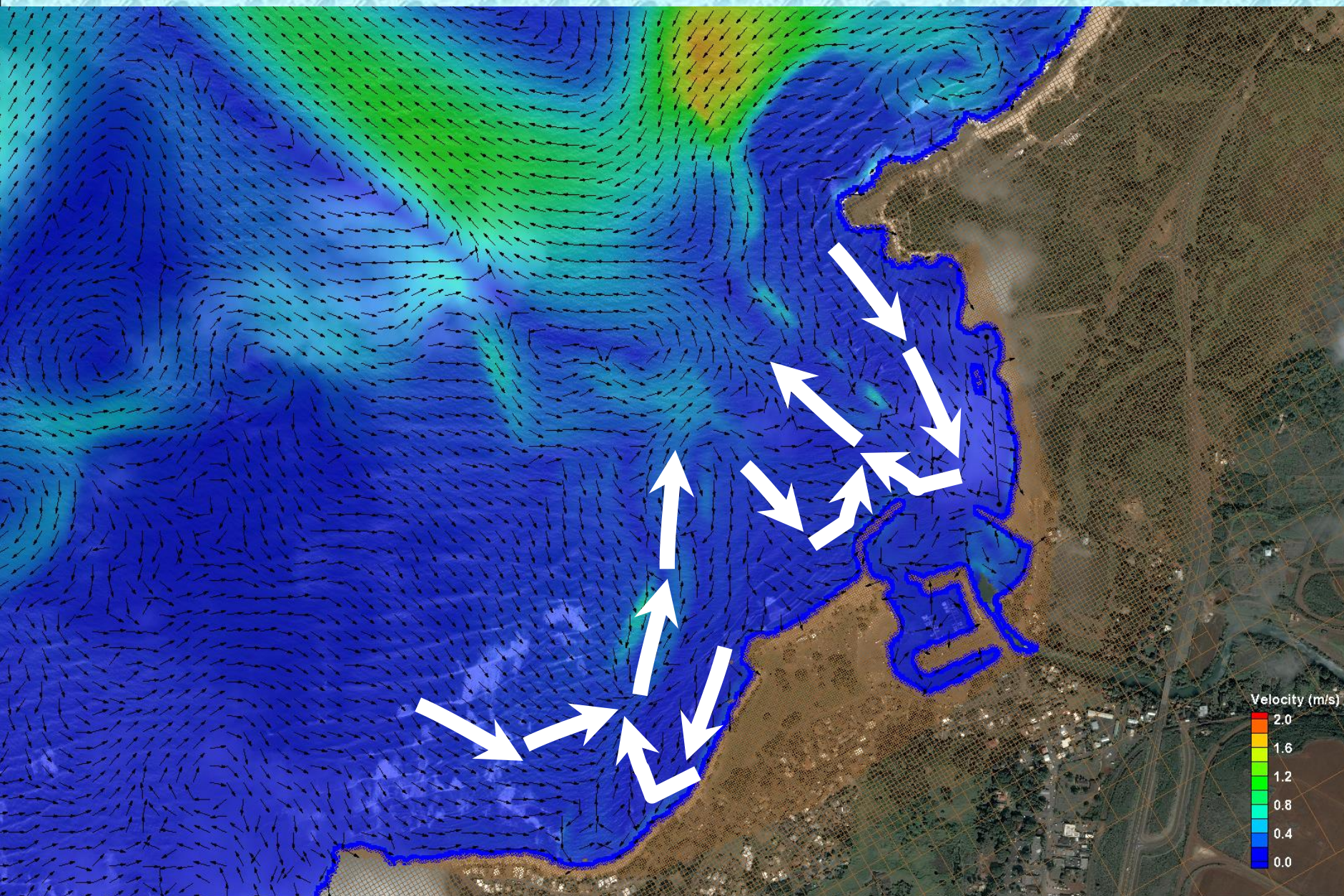
ALII BEACH

KAIKA BEACH



# CMS Flow Currents from Steering Run (Waves ⇔ Circulation)

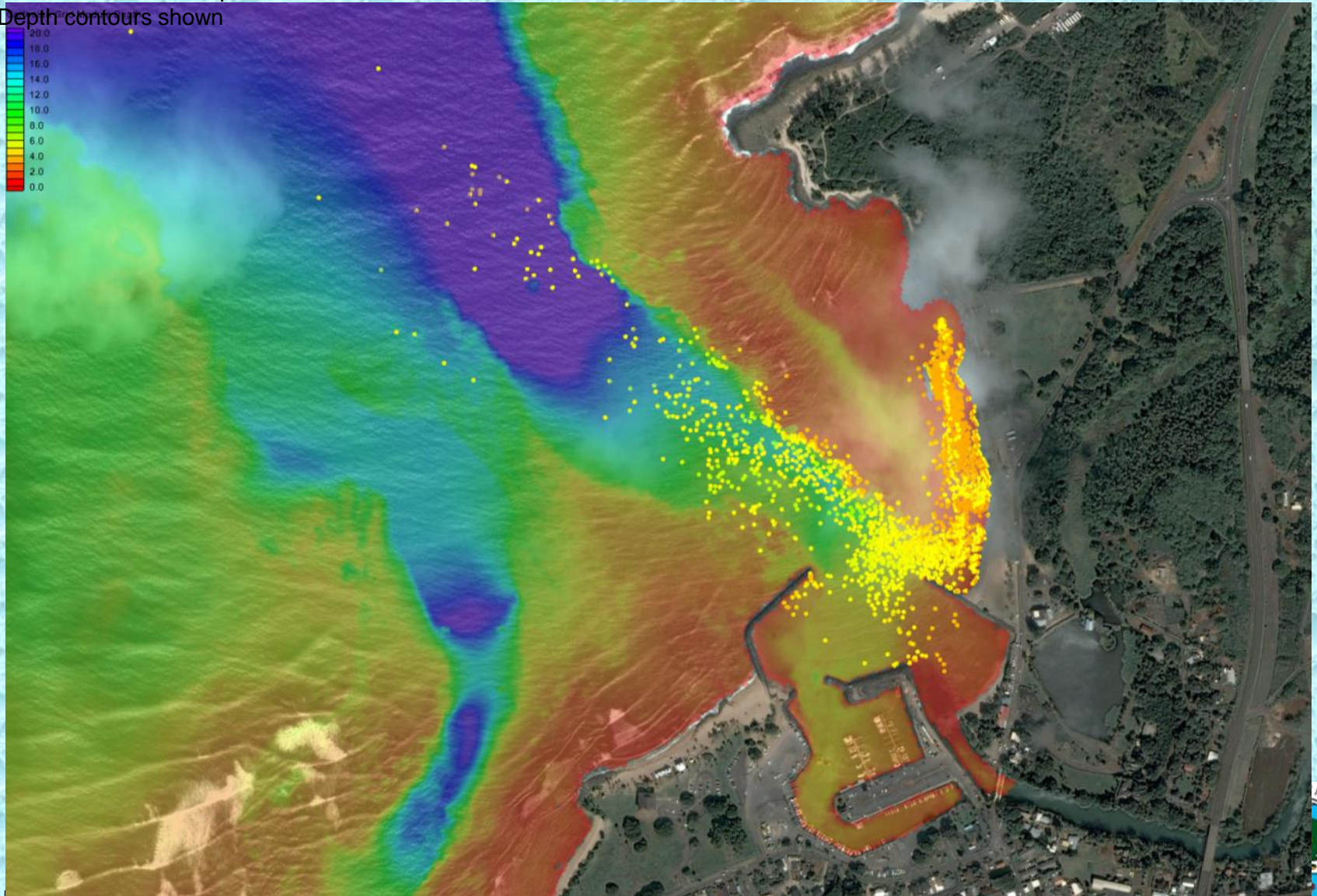
- Approximate 10-year event (January 1998)  
 $H_o = 8.0\text{m}$ ,  $T_p = 16\text{-}22\text{s}$ , Dir = 320 deg (NW)



# Particle Tracking Model Results for Simulated Beach Nourishment at Haleiwa Beach Park

- Results 48 hours after placement

- Depth contours shown



# Pre- Project Sediment Pathways

## 1949 Aerial Photograph (Prior to Harbor Construction)



0 400 800 1,600 Feet

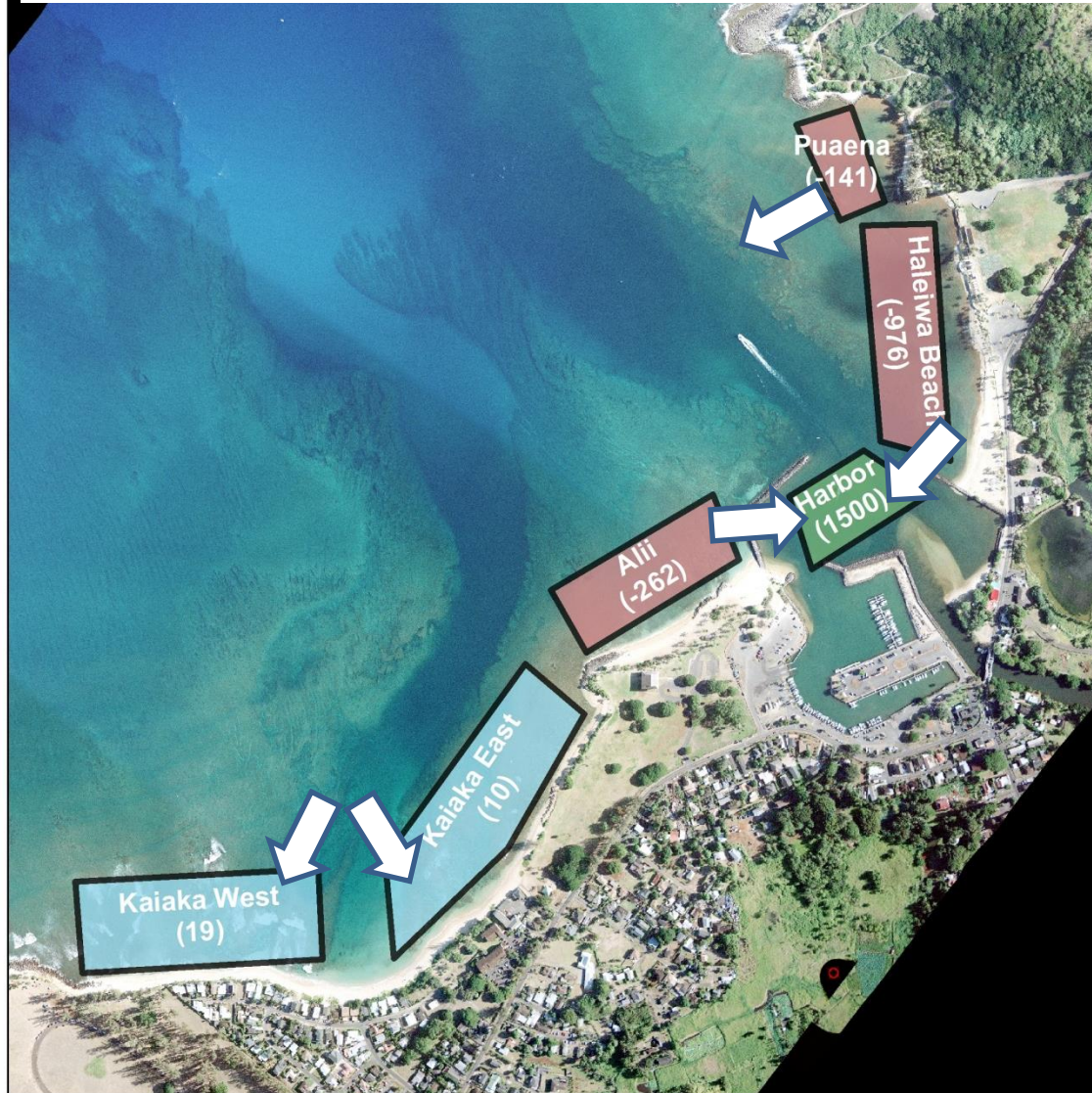


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# Post- Project Sediment Pathways

2006 Aerial Photograph (Following Harbor Construction)



0 400 800 1,600 Feet

16



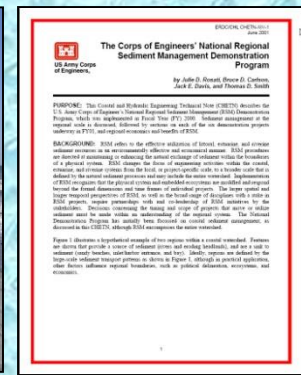
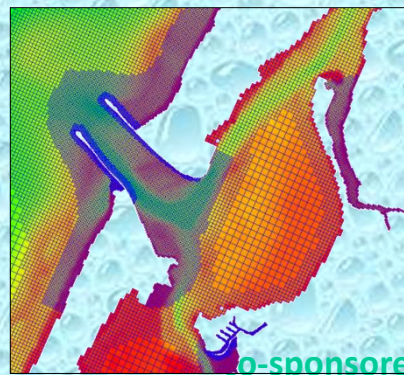
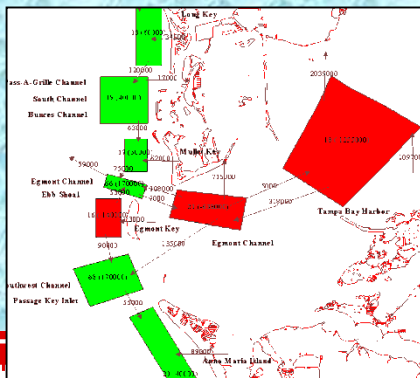
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# RSM SUMMARY

- Manage local projects in Regional Context
- Understand local/regional processes, sediment sources & sinks
- Enhance & Share data, tools, technology, and lessons learned
- Seek solutions which maximize use of sediment/minimize costs
- Collaboration/communication with stakeholders and partners
  - ▶ Identify Opportunities, Decision Making
  - ▶ Coordinate and Implement Actions
- Take Action: Construct



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# FY15 SUNSET BEACH RSM

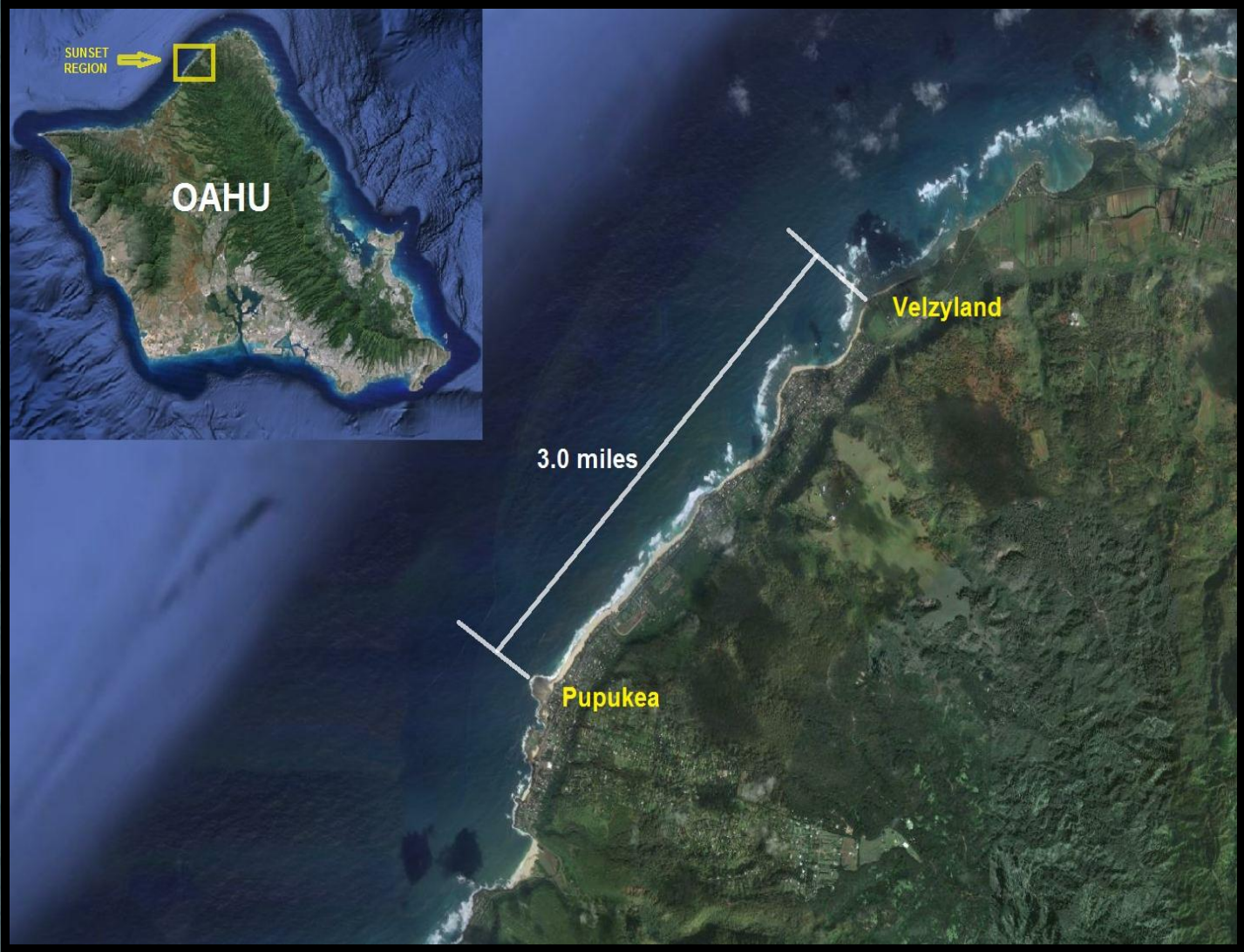
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# SUNSET BEACH REGION



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# STUDY TASKS

- Shoreline Change Analysis
- Coastal Modeling
- Regional Sediment Budget
- Identify Potential RSM Actions
- Sunset Beach RSM Workshop



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# SUNSET BEACH REGION

## Problem Statement/Issue

- In December 2013, the shifting shorelines within the region threatened upland development.
- Regional sediment transport pathways relative to long-term and short-term shoreline changes are not well understood within the region.
- Methods to utilize beach quality sand to stabilize critically eroding reaches of the shoreline need to be investigated.



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Erosion near Rocky Point during the winter of 2013.

# SUNSET BEACH REGION

## Approach to Address Problem

- Evaluate historical shoreline change using USGS/UH shoreline database
- Investigate seasonal movement of sediment due to winter swells and summer tradewind seas using coupled numerical models (CMS Wave and CMS Flow)
- Develop Regional Sediment Budget
- Identify potential RSM actions



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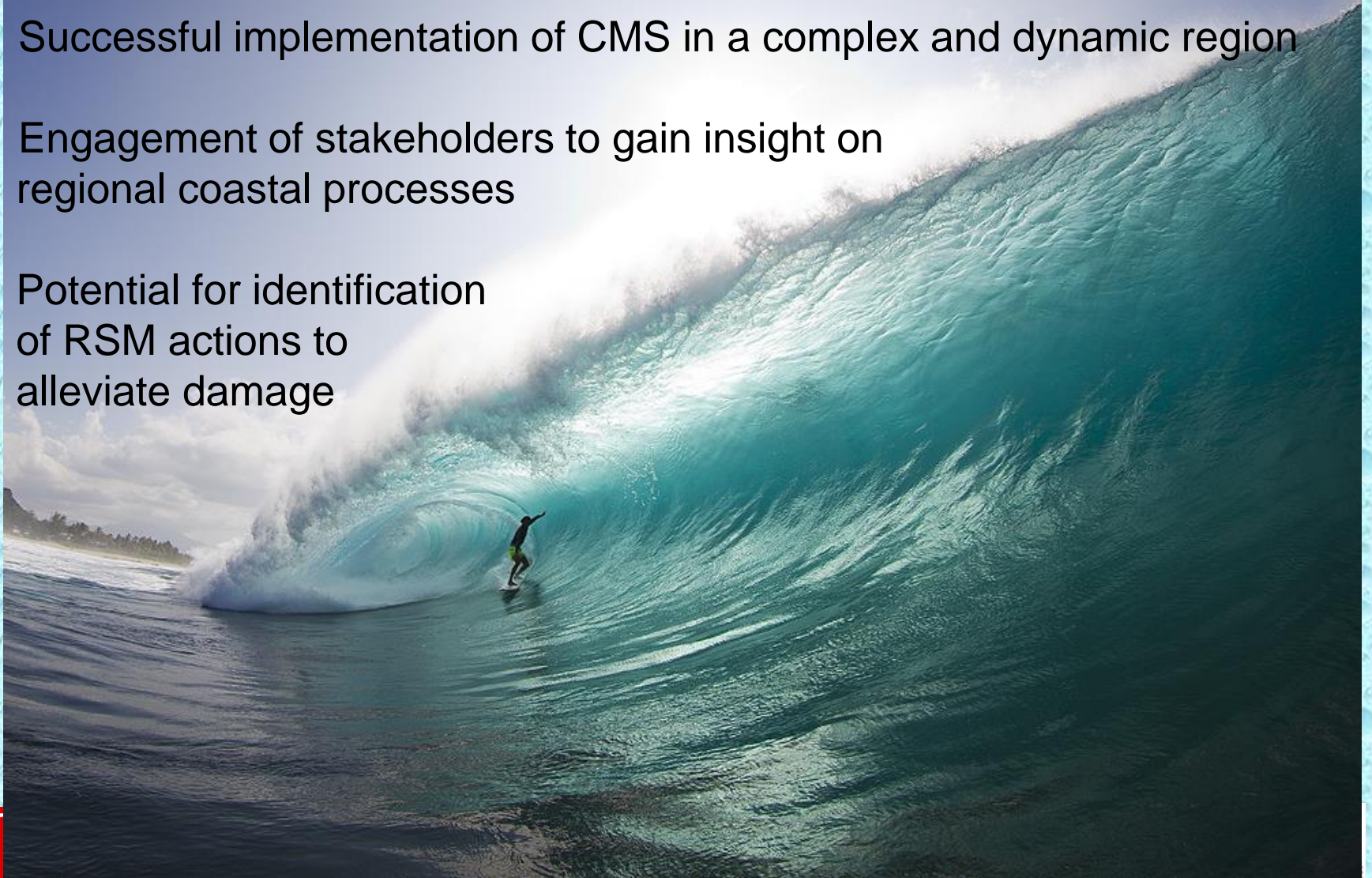
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# SUNSET BEACH REGION

- Successful implementation of CMS in a complex and dynamic region
- Engagement of stakeholders to gain insight on regional coastal processes
- Potential for identification of RSM actions to alleviate damage



# SUNSET BEACH REGION

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- A photograph of a surfer riding a large, curling wave. The surfer is wearing a red and white wetsuit and is positioned in the center of the wave's face. The water is a deep blue-green color, and the sky is a soft, hazy orange and yellow, indicating sunset. The wave is breaking, creating a large spray of white water. The overall scene is dynamic and captures the power of the ocean.
- Seasonal nature of the problem and wave climatology create challenges to potential solutions
  - Sensitivity of regional natural resources (biological and recreational) results in widely varying opinions concerning viable solutions (retreat vs. protect?)



# FY15 SUNSET BEACH RSM INVESTIGATIONS

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