FY15 RSM-EWN IPR

Honolulu District - Sunset Beach RSM, Tom Smith and Jessica Podoski

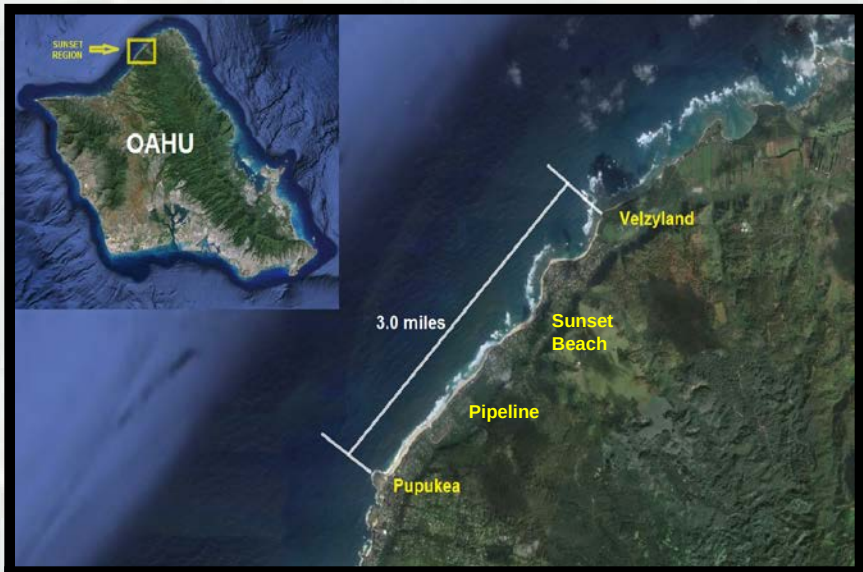
BLUF: Sunset Beach RSM studies will engage various federal, state and county agencies in the implementation of a strategy to maximize the use of the region's scarce sediment resources. The Sunset Beach RSM initiative will quantify shoreline changes, coastal processes, the sediment budget and identify potential RSM projects in the region.

Problem Statement/Issue

- In December 2013, the shifting sands within the region caused problems for several homeowners.
- Property owners were unable to acquire the necessary permits to install seawalls to protect their property.
- Honolulu City/County and State of Hawaii expressed concerns that shoreline hardening could result in the loss of the beach fronting such structures and cause impacts to adjacent shorelines (including Sunset Beach, home to some of the world's top surfing contests).

Approach to Address Problem (non-technical)

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



Erosion at Rocky Pt (between Sunset and Pipeline)

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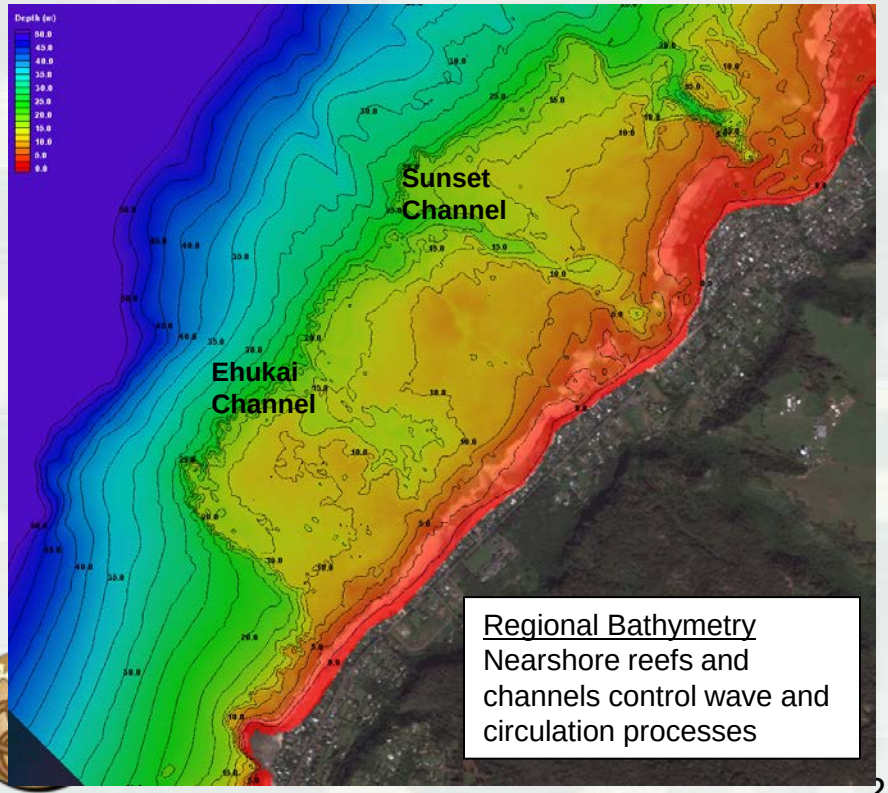
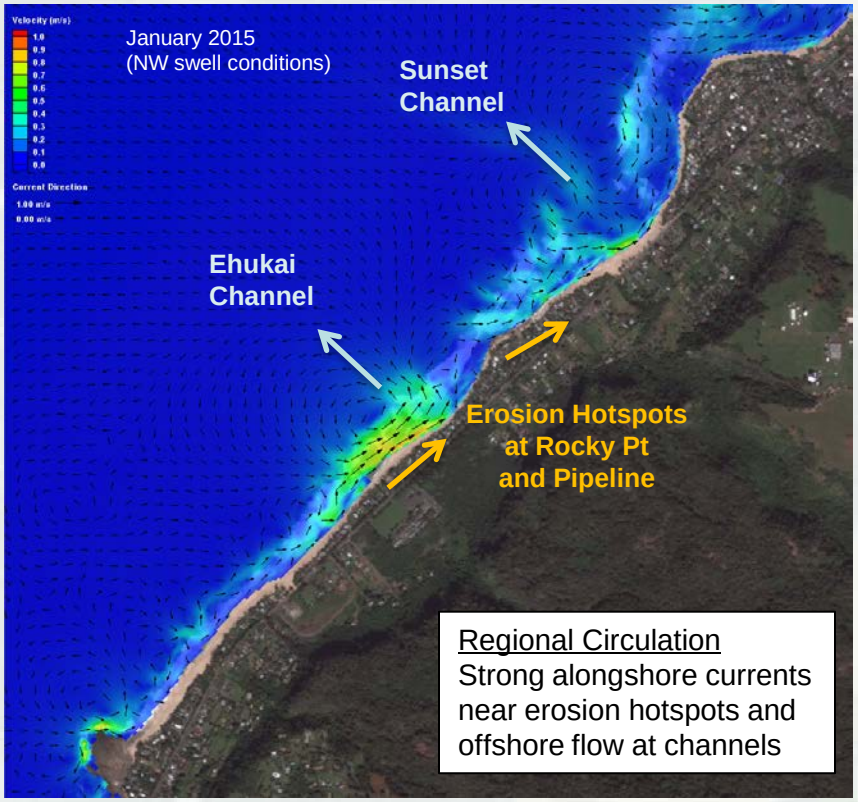
Approach to Address Problem : Tools, Models, Technologies

- Historical shoreline change rates for the regions developed based on available T-sheets and aerial photos.
- Shoreline GPS position collected during various times of year to characterize seasonal shoreline changes.
- Coastal Modeling System (CMS) numerical models (CMS-FLOW and CMS-WAVE) used to simulate water circulation and wave transformation characteristics for the region.
- Sediment transport calculations within CMS have been implemented and morphology change evaluated based on shoreline data.
- Model input – CDIP buoy wave data, NOAA water level data, UH bathymetry database (NOAA/USACE surveys)
- Calibration Data – UH nearshore wave and WL instrument data



Regional Bathymetry
Nearshore reefs and channels control wave and circulation processes



Regional Circulation
Strong alongshore currents near erosion hotspots and offshore flow at channels

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USACE RSM PDT

- Honolulu District
  - Nani Shimabuku: RSM Program Manager
  - Tom Smith: RSM Technical Manager
  - Jessica Podoski: Coastal Engineer
  - Lauren Molina: Coastal Engineer
- ERDC/CHL
  - Zeki Demirbilek: Dr. Turkey
  - Lihwa Lin: CMS Kahuna

What key leveraging opportunity(s) did stakeholders/partners provide?

- UH/SOEST – Historic Shorelines and Wave Data
- DLNR/OCCL – Liaison with stakeholder groups
- UH – Student Labor (profile surveys, etc.)

Stakeholders/Partners

- State of Hawaii DLNR/OCCL (Sponsor)
- North Shore homeowners
- Stakeholder groups (Keep the North Shore Country, etc.)
- UH/SOEST

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UPs – 3 Positives from effort

- Successful implementation of CMS in a complex and dynamic region
- Engaged stakeholders and providing insight to coastal processes
- Potential for stream-clearing and backpassing of sand during winter months to mitigate wave impacts

Not that turkey again!

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DOWNs – 3 Negatives from effort

- Delay in 2013 LiDAR data processing required use of 8 – 15 year old bathymetry data for models
- Seasonal nature of the problem and large wave events create challenges to engineering solutions (large armor stone, periodically exposed beach rock, coral reefs)
- High visibility and well-known area results in widely varying opinions about viable solutions (retreat vs. protect?)

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Title:

Value to the Nation

- Cost savings: $? – Potential reduction in infrastructure damage
- Value added : Preservation of a “legacy” beach and tourism mecca
- Leveraging resources: Opportunity to partner with state agencies/university
- $/habitat credits: N/A
- Environmental benefits: N/A
- Improved partnerships, happy stakeholders: Benefit to non-Fed sponsor and stakeholder groups builds trust and goodwill
- Permitting and compliance requirements improved (cost savings from reduction in requirements): Potential reduction to emergency permits for sandbags, reduction in illegal property-saving measures
- Capacity of placement site saved and therefore $ saved on coordination, surveys, modeling, etc to designate a new placement site not needed for x-years: N/A
- Cost savings from avoiding a lawsuit: May avoid litigation for State/County
- Other?