FY13 RSM IPR

Honolulu District, Haleiwa Region

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BLUF: RSM investigations are being conducted to develop a sediment budget for the Haleiwa Region. Impacts of the Haleiwa Small Boat Harbor to be quantified. Identifying actions to be taken and agency leads.

Description/Challenges

- Conduct RSM investigations in the Haleiwa Region on the island of Oahu.
- Studies include shoreline change analysis, WIS wave transformation, nearshore wave and current modeling and development of a regional sediment budget.
- Haleiwa Small Boat Harbor (HSBH) has impacted adjacent shorelines.
- Erosion threatens historic structure and beach is narrowing.

Objectives

- Improve sediment management and reduce project costs at Haleiwa Small Boat Harbor.
- Identify sediment pathways within the regions.
- Link sediment management activities with the needs of the coastal community.

Approach

- CMSWave transformation of WIS data into the Haleiwa Region.
- Use CMSWave and CMSFlow to assess nearshore waves and currents.
- Conduct Haleiwa Region workshop, identify RSM action items and engage agency proponents.

Deliverables and Schedule

•TASK 1: Initiate New RSM Regions	1/30/13
•TASK 2: Coastal Modeling	7/30/13
•TASK 3: Shoreline Change Analysis	7/30/13
•TASK 4: Regional Sediment Budgets TN	9/30/13
•TASK 5: Potential RSM Projects TN	9/30/13
•TASK 6: Updated Hawaii RSM Web Site	9/30/13
•TASK 7: Conduct Haleiwa Region Workshop	6/20/13
•TASK 8: Attend FY13 RSM Workshop	8/20/13

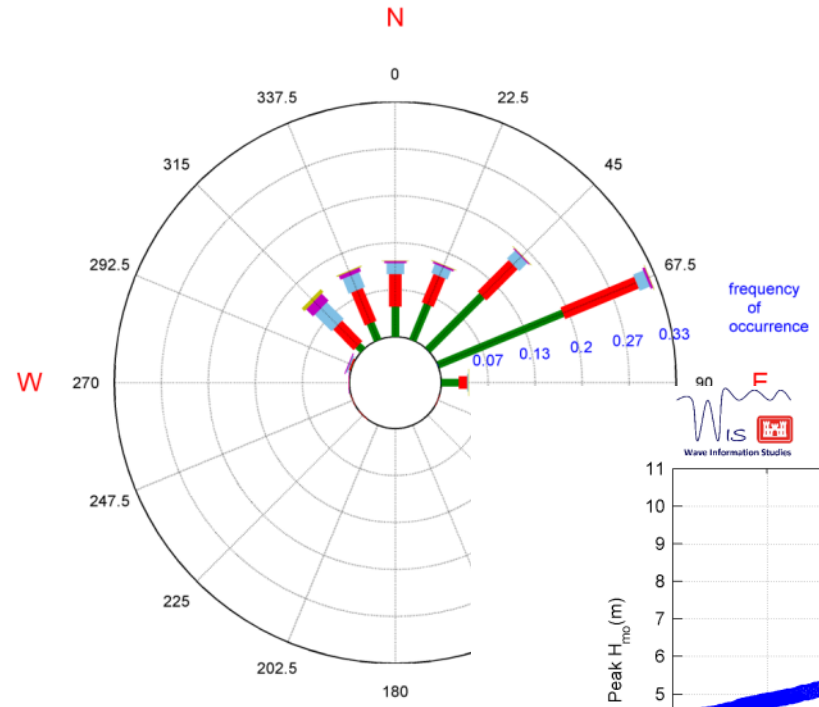

NORTH SHORE HUI WA`A

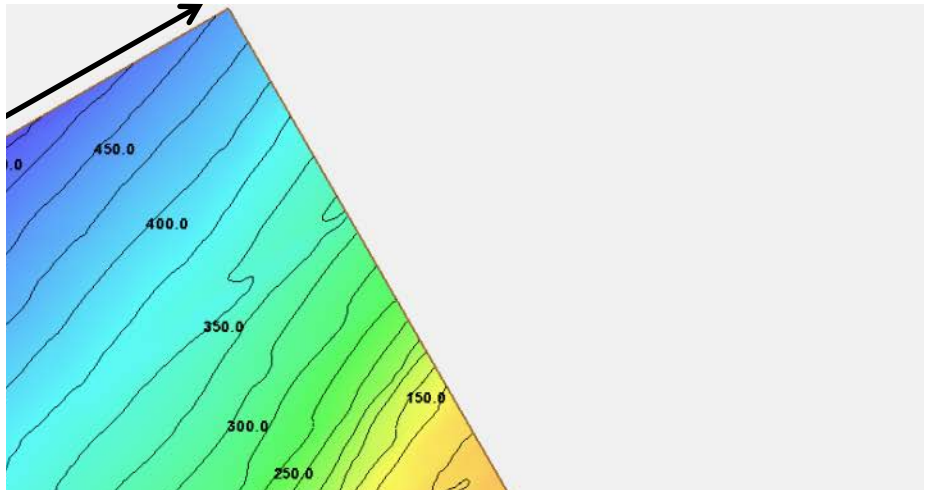
Wave Information Studies

Pacific WIS Station 82509

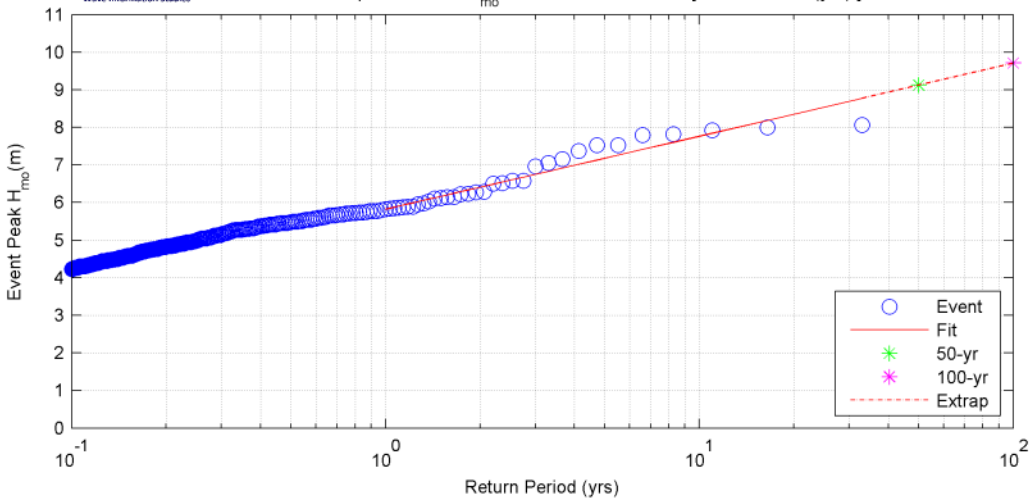
01-Jan-1980 thru 31-Dec-2011
Long: -158.1° Lat: 21.95° Depth:2961 m
Total Obs : 280511

WAVE ROSE





Storm Event Return Period of 32-yr (1980-2011) Wave Hindcast
Pacific Station 82509 : Lat: 21.950° Lon:-158.100° Depth: 2961m
Linear Fit to top 21 events: H_{mo} = 5.829 + 0.84279 • ln [Return Period(yrs)]



Top 10 events based on Peak H_{mo}

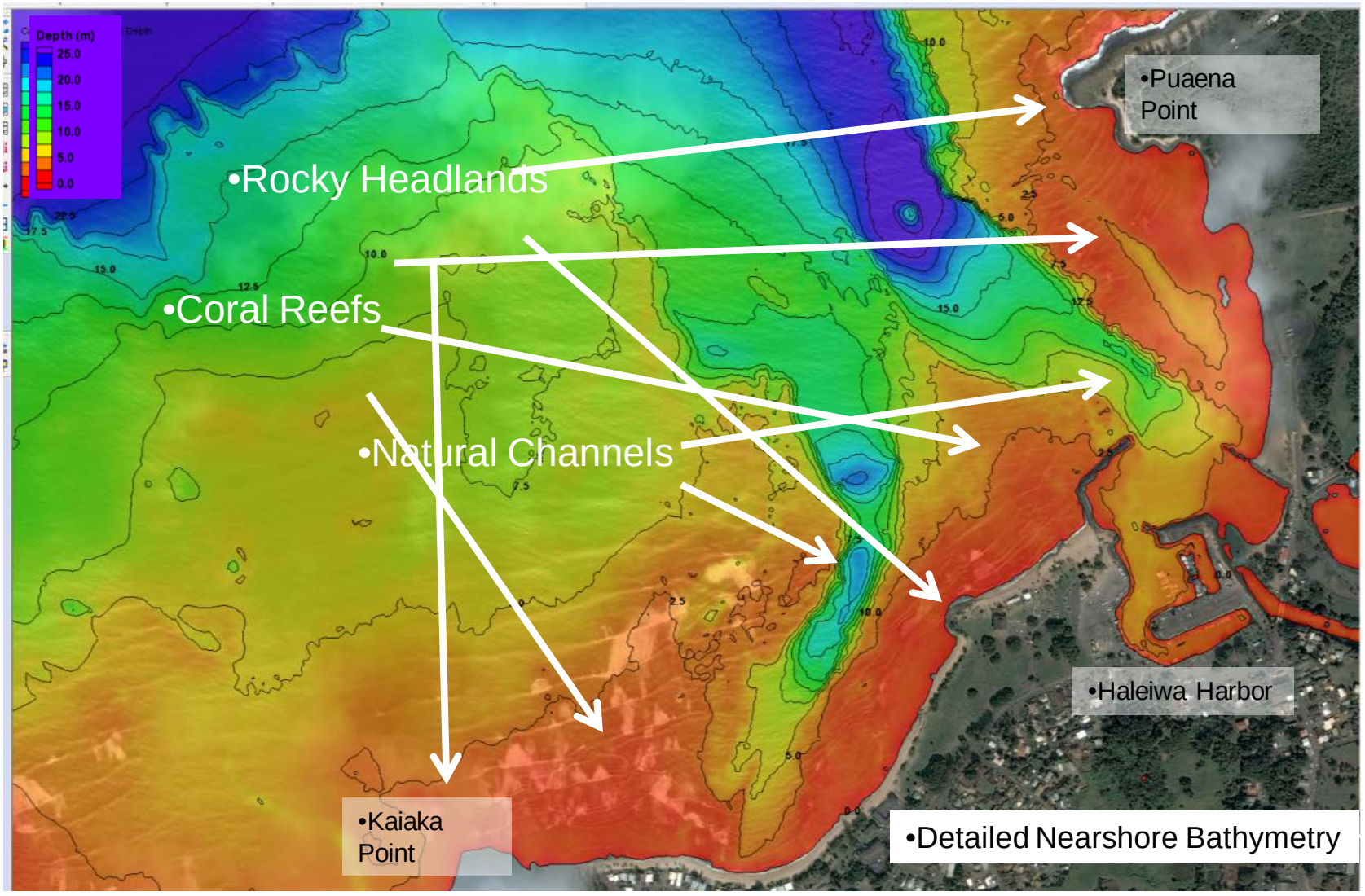
Event	Date/Time(UTC)	H_{mo}	T_p	θ_{mean}	Event	Date/Time(UTC)	H_{mo}	T_p	θ_{mean}
1	1983/02/10 22:00	8.07	18.07	320.0	6	1987/01/10 03:00	7.53	19.01	316.0
2	1998/01/28 16:00	8.00	21.10	321.0	7	1980/02/17 07:00	7.53	17.53	318.0
3	1985/01/15 04:00	7.92	16.74	312.0	8	2003/01/05 12:00	7.37	17.80	314.0
4	1981/01/20 10:00	7.82	18.18	321.0	9	1985/12/10 17:00	7.15	18.61	320.0
5	1986/02/23 11:00	7.80	19.38	306.0	10	1983/02/17 23:00	7.05	18.45	319.0

An event is defined as any period when H_{mo} > 4.00m

θ_{mean} is direction that waves are arriving from

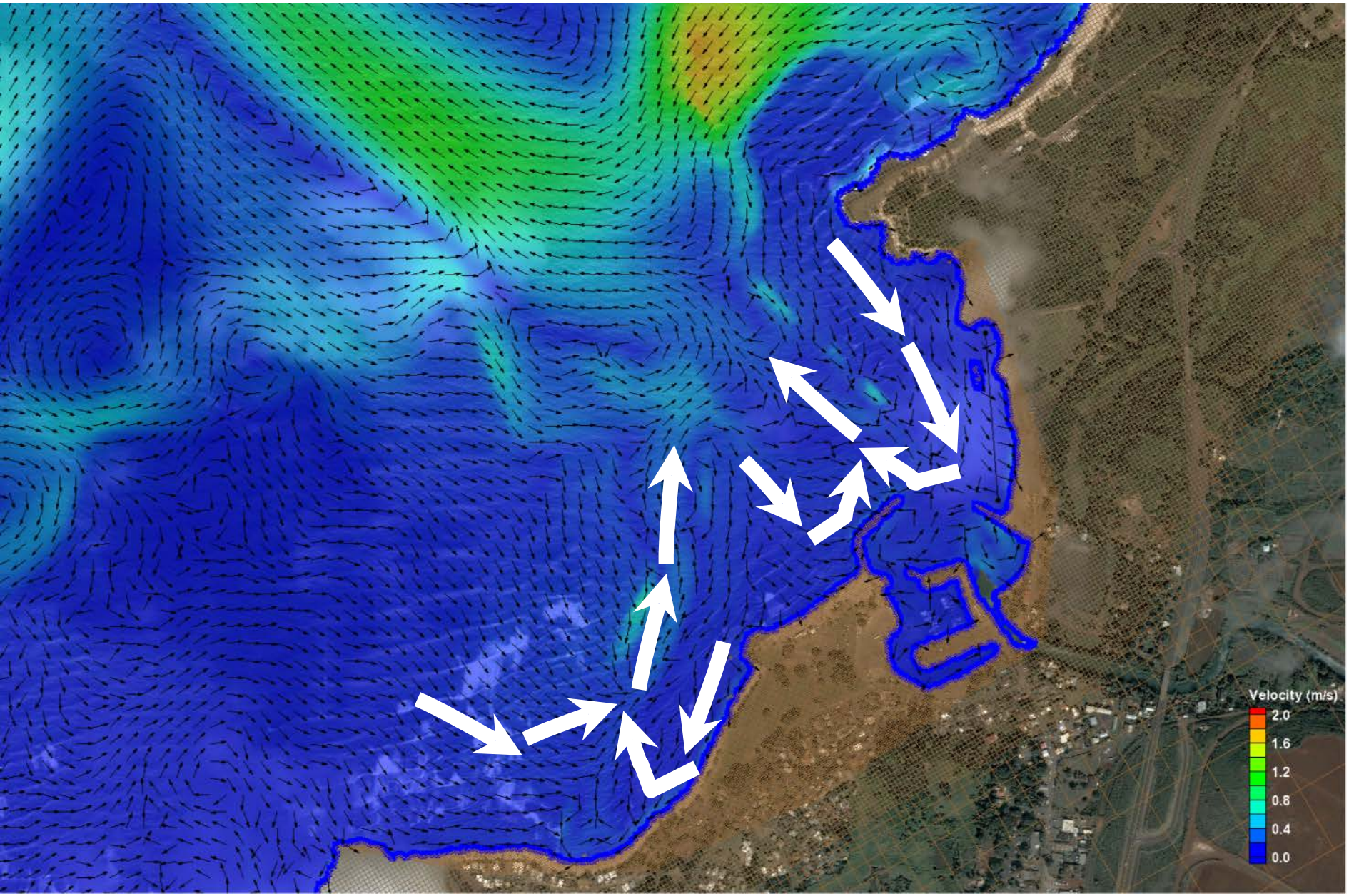
•Nearshore Bathymetry

• Two natural channels (Kaiaka Bay and offshore Haleiwa Harbor)
• Coral reefs
• Rock headlands enclosing littoral cell and affecting longshore transport



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

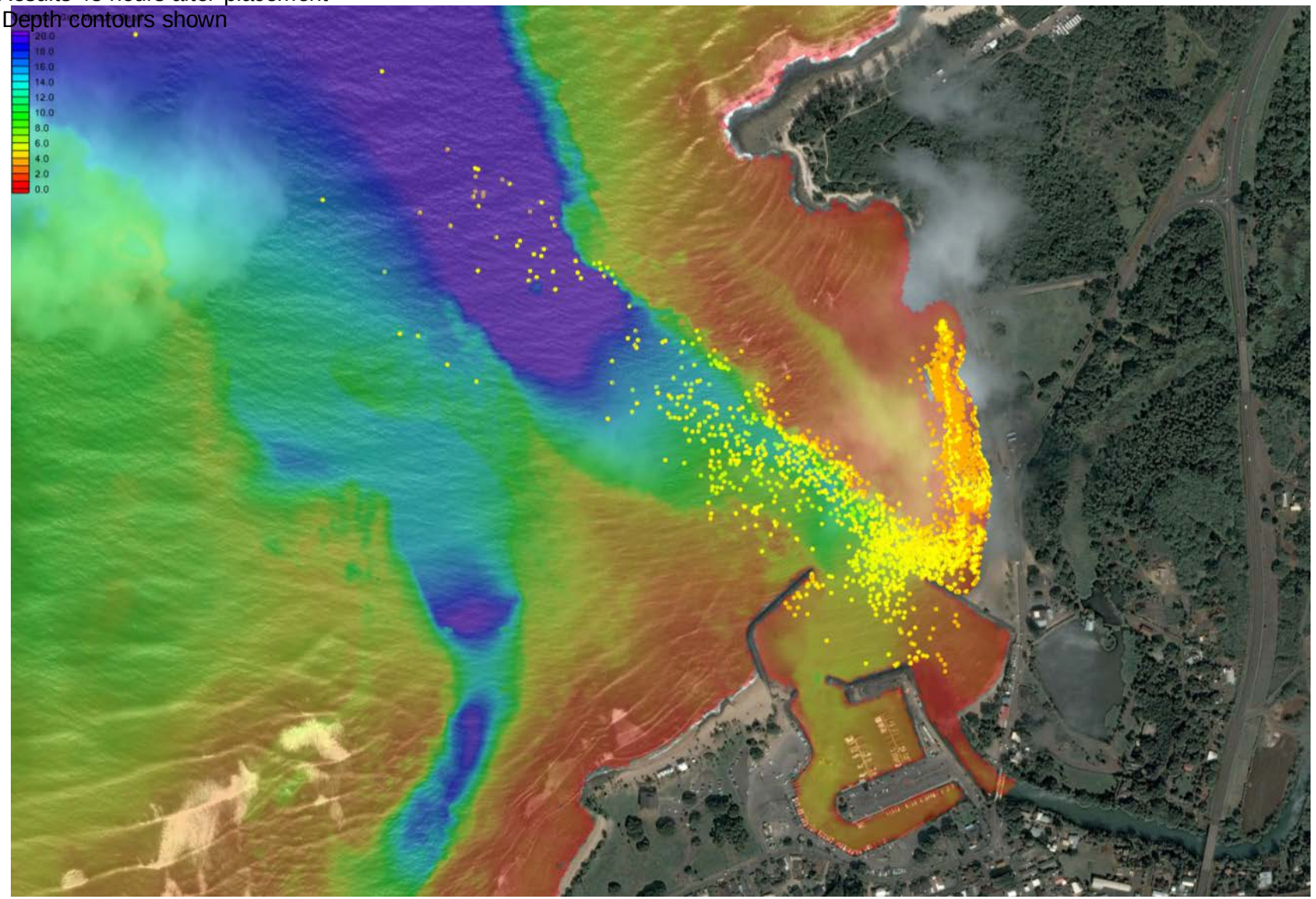
- Approximate 10-year event (January 1998)
  - •H_o = 8.0m, Tp= 16-22s, Dir = 320 deg (NW)



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

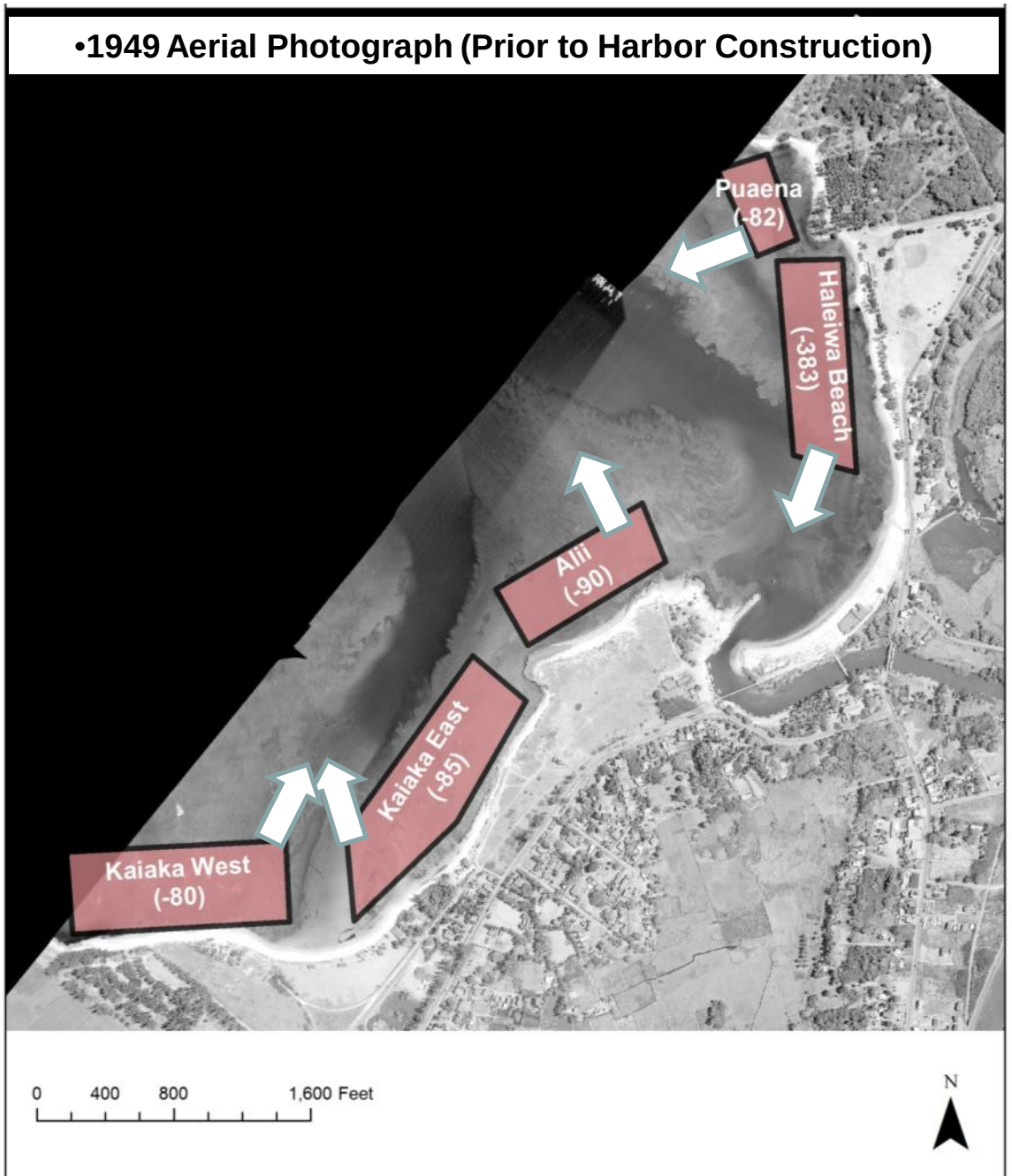
•Results 48 hours after placement

• Depth contours shown



Pre- Project Sediment Pathways

•1949 Aerial Photograph (Prior to Harbor Construction)



Post- Project Sediment Pathways

PDT Members

- POH: Nani (PM)/Tom (TL)/Jessica (H&H)/Justin (H&H)/Sarah (IT)
- POD: David Lau
- State: Sam Lemmo and Brad Romine (OCCL)
- State: Ed Underwood and Eric Yuasa (DOBOR)
- County: Clifford Lau and Terry Hildebrand (Parks)

Leveraging/Collaborative Opportunities

- State of Hawaii – Office of Conservation and Coastal Lands
- State of Hawaii – Department of Boating and Outdoor Recreation
- USACE – Haleiwa Small Boat Harbor O&M
- City & County of Honolulu – Department of Parks and Recreation
- North Shore Community and Tourists

HALEIWA REGION WORKSHOP - RSM ACTION ITEMS

PROCESSES

- Incorporate the findings of the City & County of Honolulu's (C&C) Haleiwa Beach Park (HBP) study into an RSM Technical Note. C&C study to include sand source investigations.
- Conduct a shoaling analysis to determine where sediment pathways are depositing sand in the region and use those areas as sustainable sand sources.
- Investigate natural mineral tracers that may indicate where the sand is going.
- Identify the source of the problem and look for natural clues that may provide solutions.
- Intercept excess sand before it goes over the breakwater at Alii Beach.
- Consider construction of dunes along portions of the region's shoreline to reduce wave inundation.
- Provide public outreach on coastal processes and beach nourishment.

ENVIRONMENTAL

- Engage applicable environmental agencies (including but not limited to NMFS, USFWS, USACE, EPA and DLNR-DOH) that oversee marine habitat.
- Continuously engage with DOH and other environmental agencies on the benefits of managing sediment on a regional scale.
- Develop and execute a programmatic agreement to place beach quality sand from harbors (i.e. Haleiwa Small Boat Harbor) onto adjacent shorelines.
- Coordinate the use of offshore sand sources in the region with environmental agencies.
- Identify species of concern include corals, sea turtles, monk seals, shorebirds, etc.
- Conduct surveys to quantify the density of marine resources.
- Quantify impacts to organisms within and adjacent to the HSBH breakwater and HBP groin.

IMPEMENTATION

- Conduct a sand tracer study to determine where the sand is going prior to any new construction.
- Sand tighten the Haleiwa Beach Park groin, nourish beach and monitor to determine effectiveness.
- Investigate O&M requirements for the HBP shore protection project.
- Indentify likely sand sources for nourishment of HBP.
- Conduct a pilot bypassing project of sand from Alii Beach to HBP.
- Grade the profile along the harborside of Alii Beach periodically to reduce wave overtopping of breakwater.
- Conduct a pilot project to clean marginal quality sand.
- Stockpile material dredged from HSBH for subsequent cleaning and eventual placement on the beach.
- Identify and coordinate potential stockpile locations.


THANK YOU