# BRIDGING THE GAP BETWEEN SCIENCE AND COASTAL MANAGEMENT IN HAWAIʻI

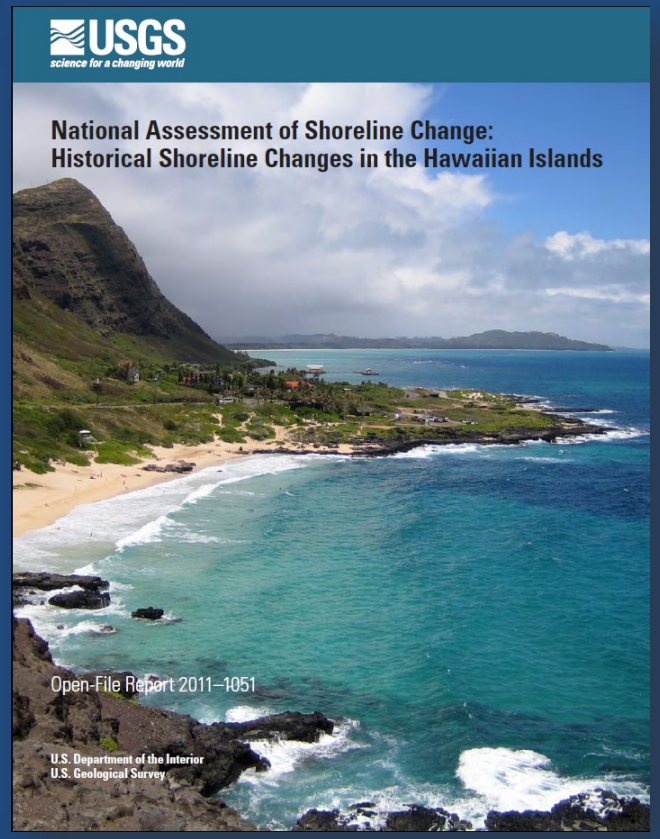
NOAA Hydrographic Services Review Panel
September 22, 2022

Tara M. Owens
Extension Faculty, Coastal Processes and Hazards Specialist
University of Hawaiʻi Sea Grant College Program
taram@hawaii.edu

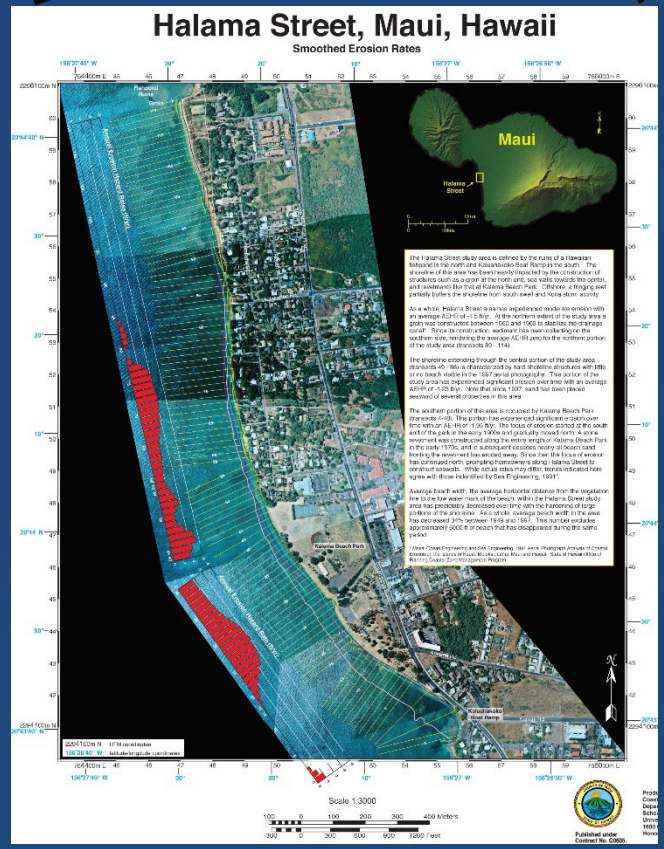

DANGER
Sea Wall is Crumbling
Do Not Climb on It

# EROSION IS WIDESPREAD ON MAUI

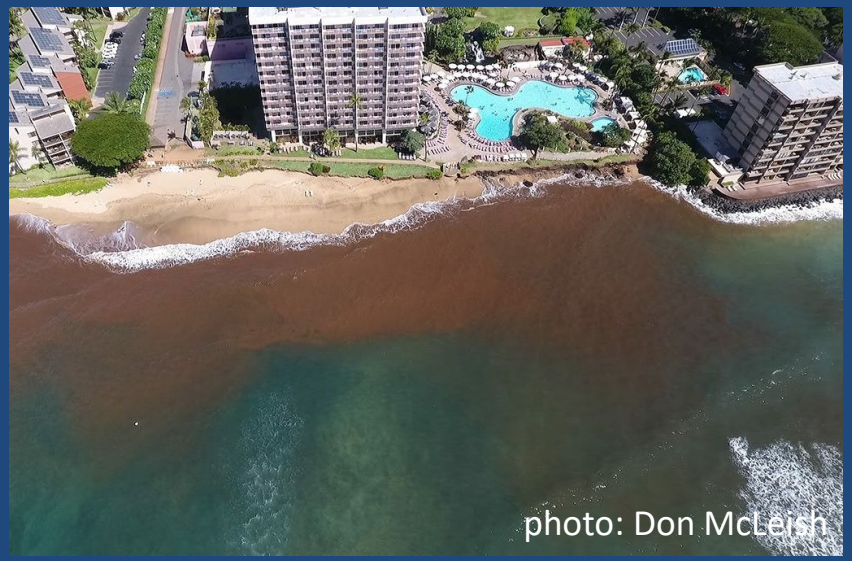
- 70% of Hawai‘i shorelines are eroding over the long-term; 85% for Maui.
- Maui’s beaches are experiencing the highest rates of erosion for the Hawaiian islands.
- Maui has the highest percentage of beach loss (11% or ~4 miles).
- Beaches also have high seasonal variability, increasing risks.




pubs.usgs.gov/of/2011/1051/

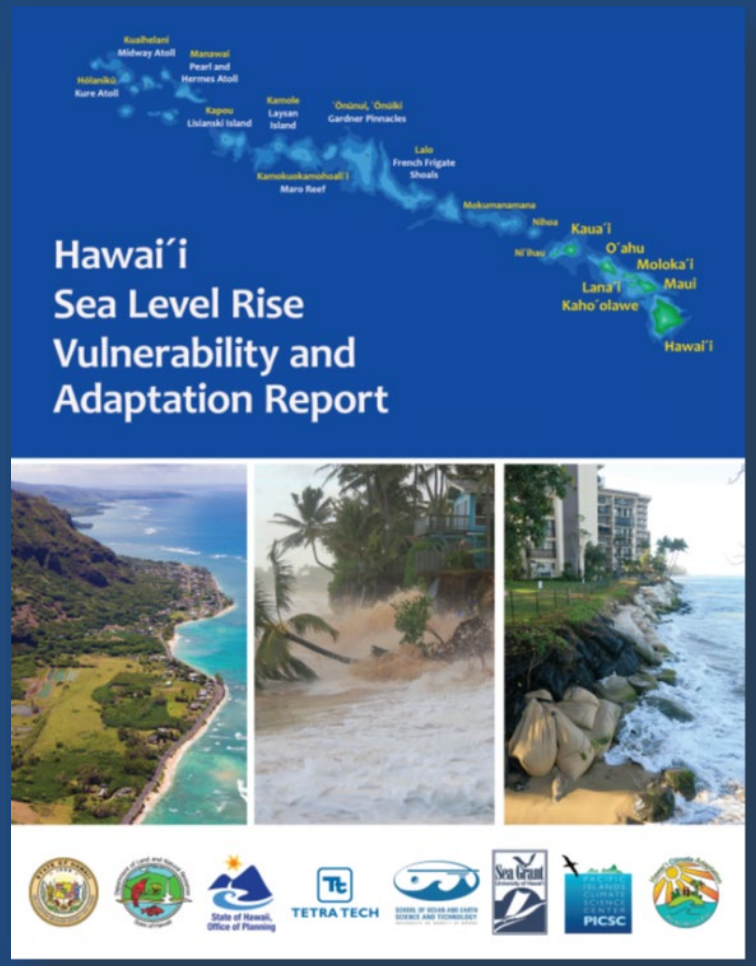


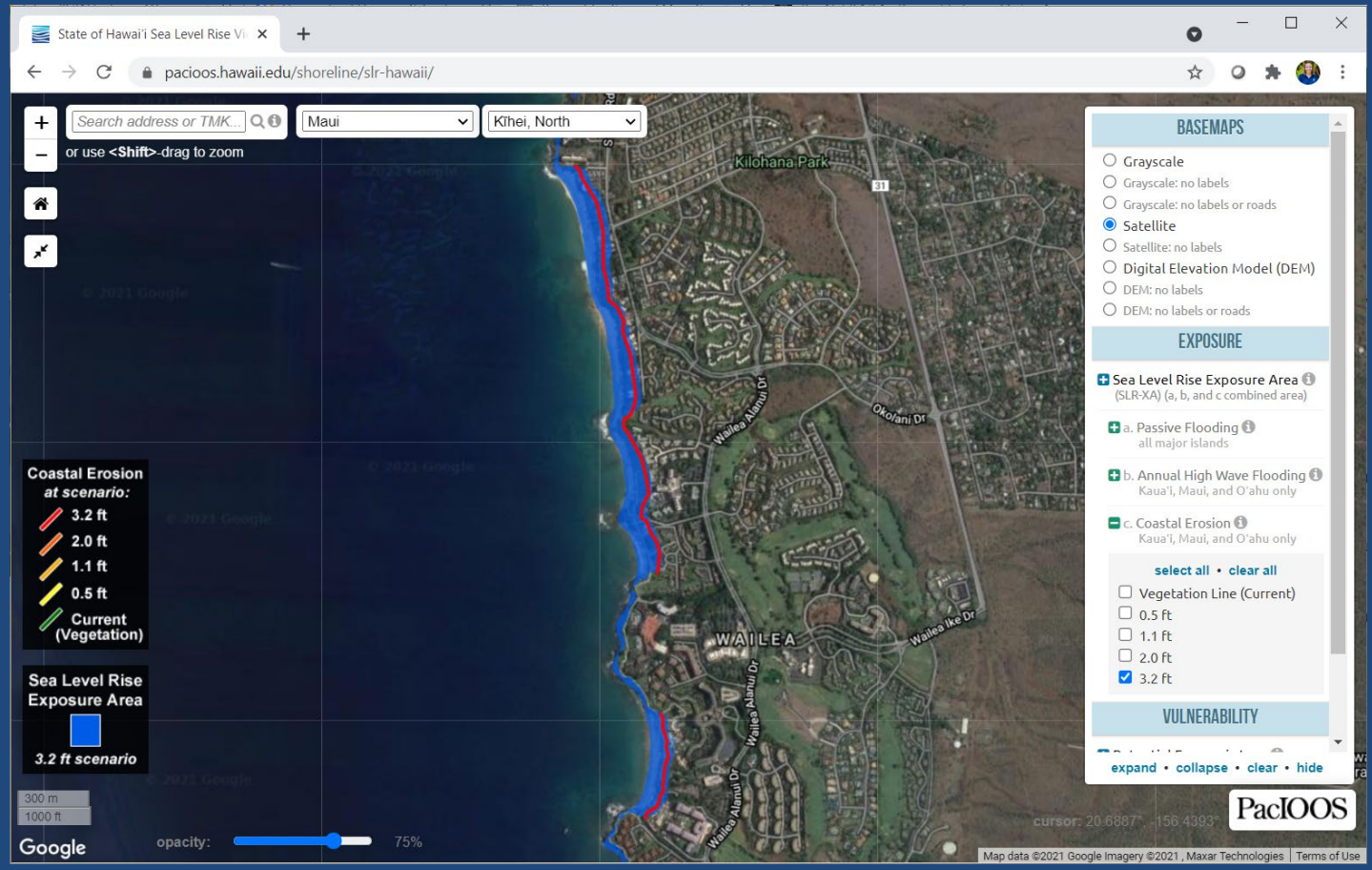
# EROSION IS WIDESPREAD ON MAUI



# THE HAWAIʻI SEA LEVEL RISE REPORT & VIEWER



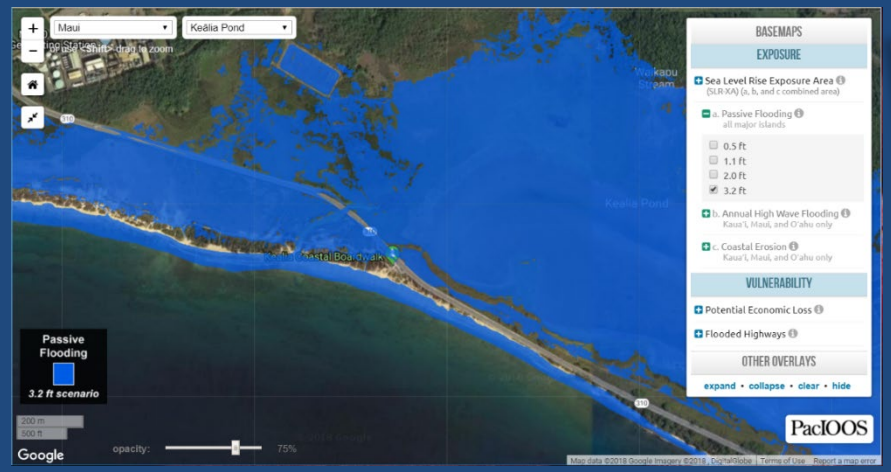




***www.climateadaptation.hawaii.gov***

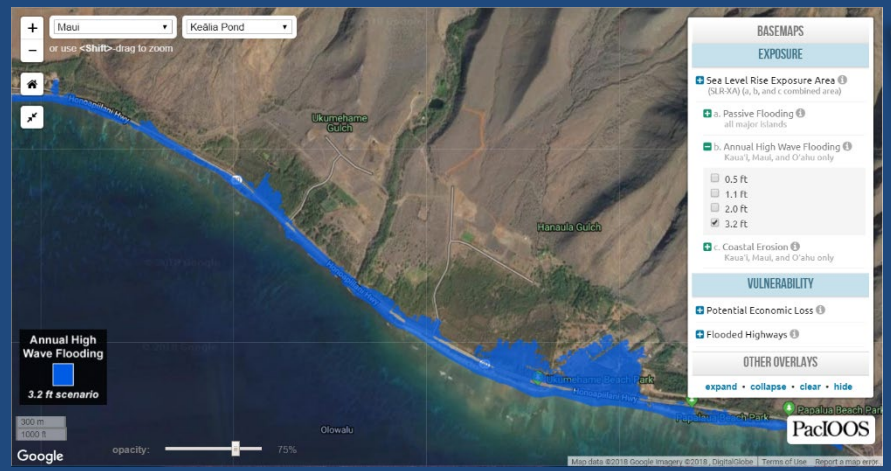
***www.hawaiisealevelriseviewer.org***

# SEA LEVEL RISE IMPACTS

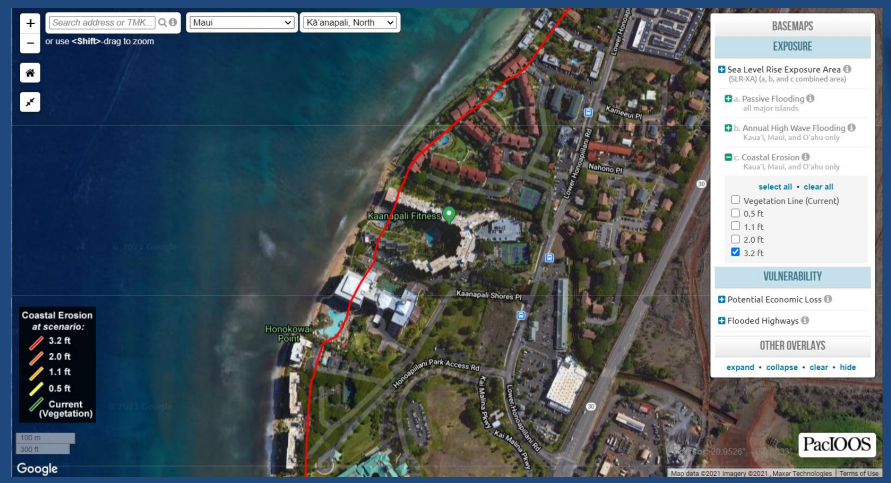
Passive (high-tide) flooding



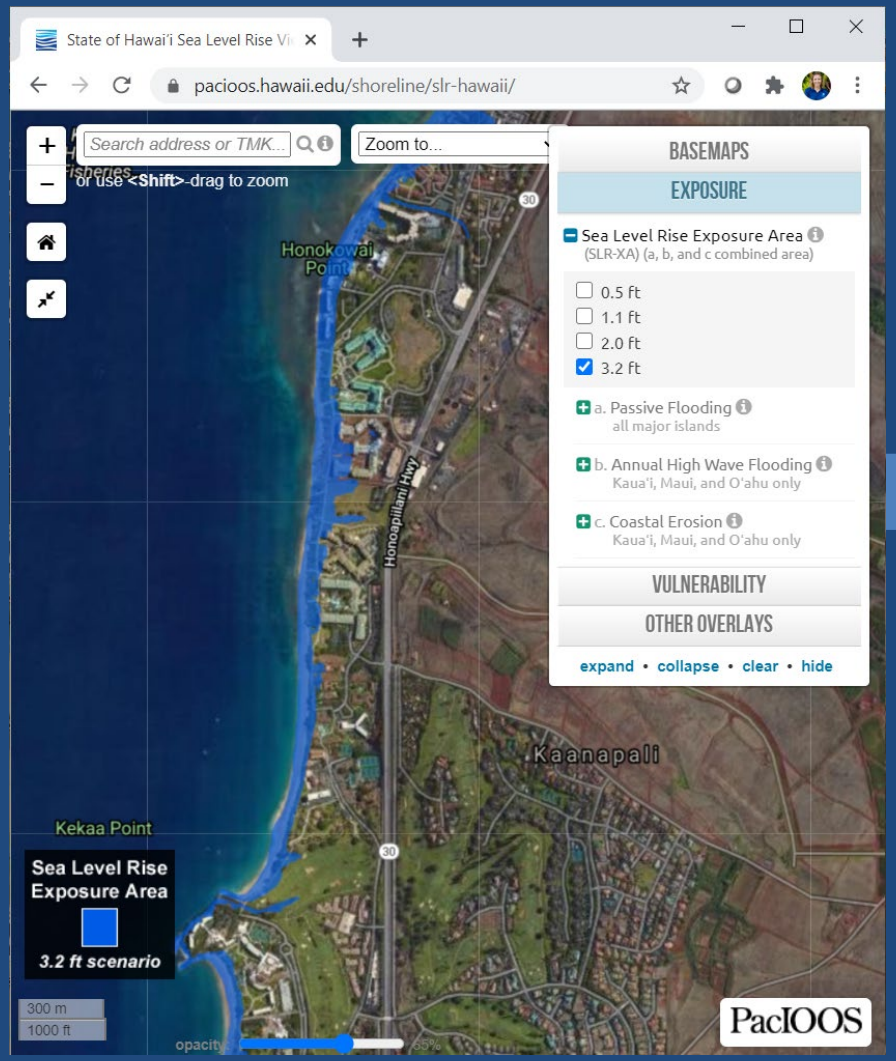

Annual high wave flooding




Coastal erosion




# MAUI: SEA LEVEL RISE SCIENCE TO APPLICATION




Vulnerability Assessments

Hazard Mitigation Plans

Community Plans

Shoreline Setbacks

# WEST MAUI: TAILORED TOOLS

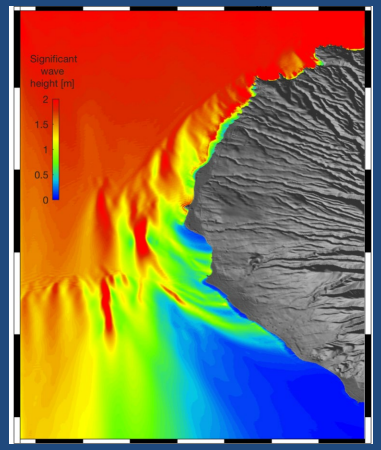
Two Distinct Tools:

1. Wave Run-up Forecast
   - site-specific wave run-up forecast for the coming 6 days
   - signals potential impacts to inform preparation and response
2. Wave Flooding Tool
   - site specific future scenarios with sea level rise
   - informs land use planning

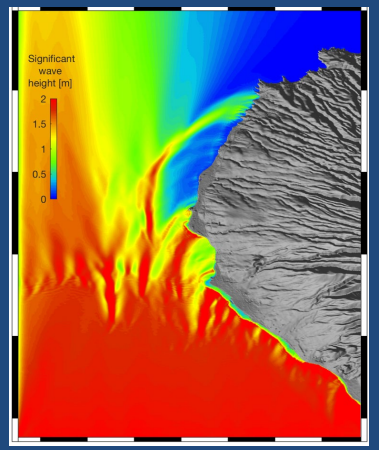
Credit: Asa Ellison

# WEST MAUI 6-DAY WAVE RUN-UP FORECAST

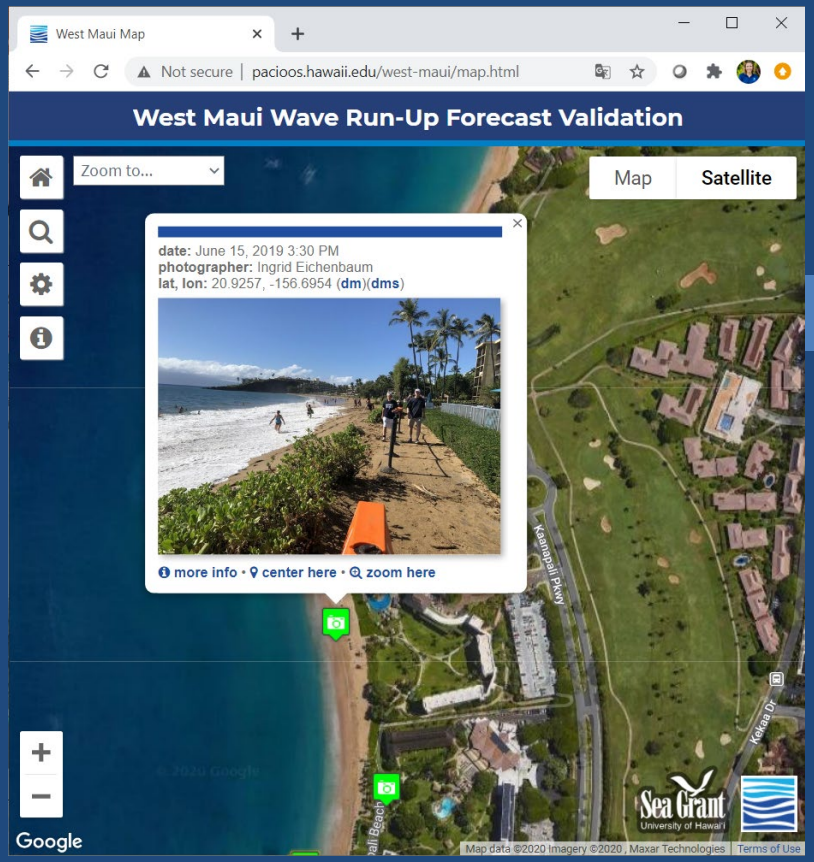
Wave Model:
*North swell*

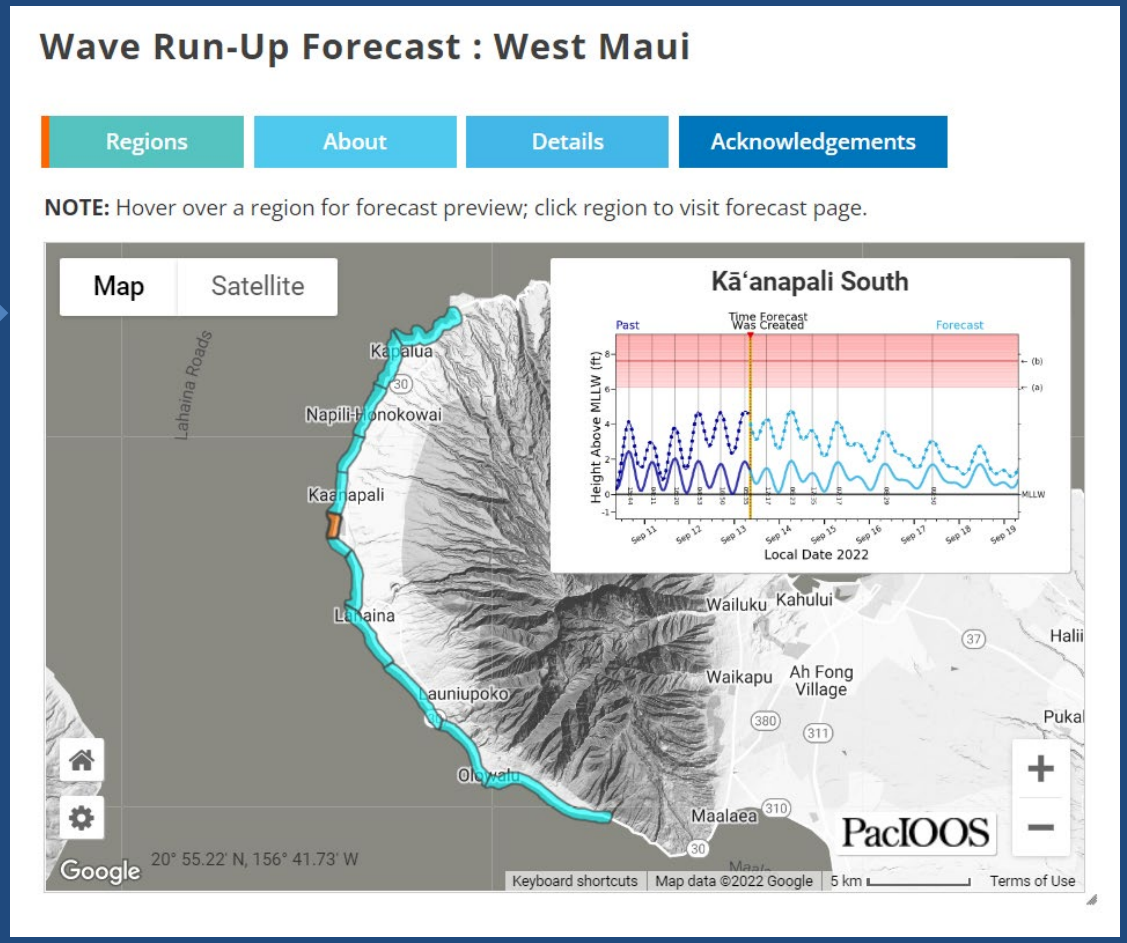



Wave Model:
*South swell*



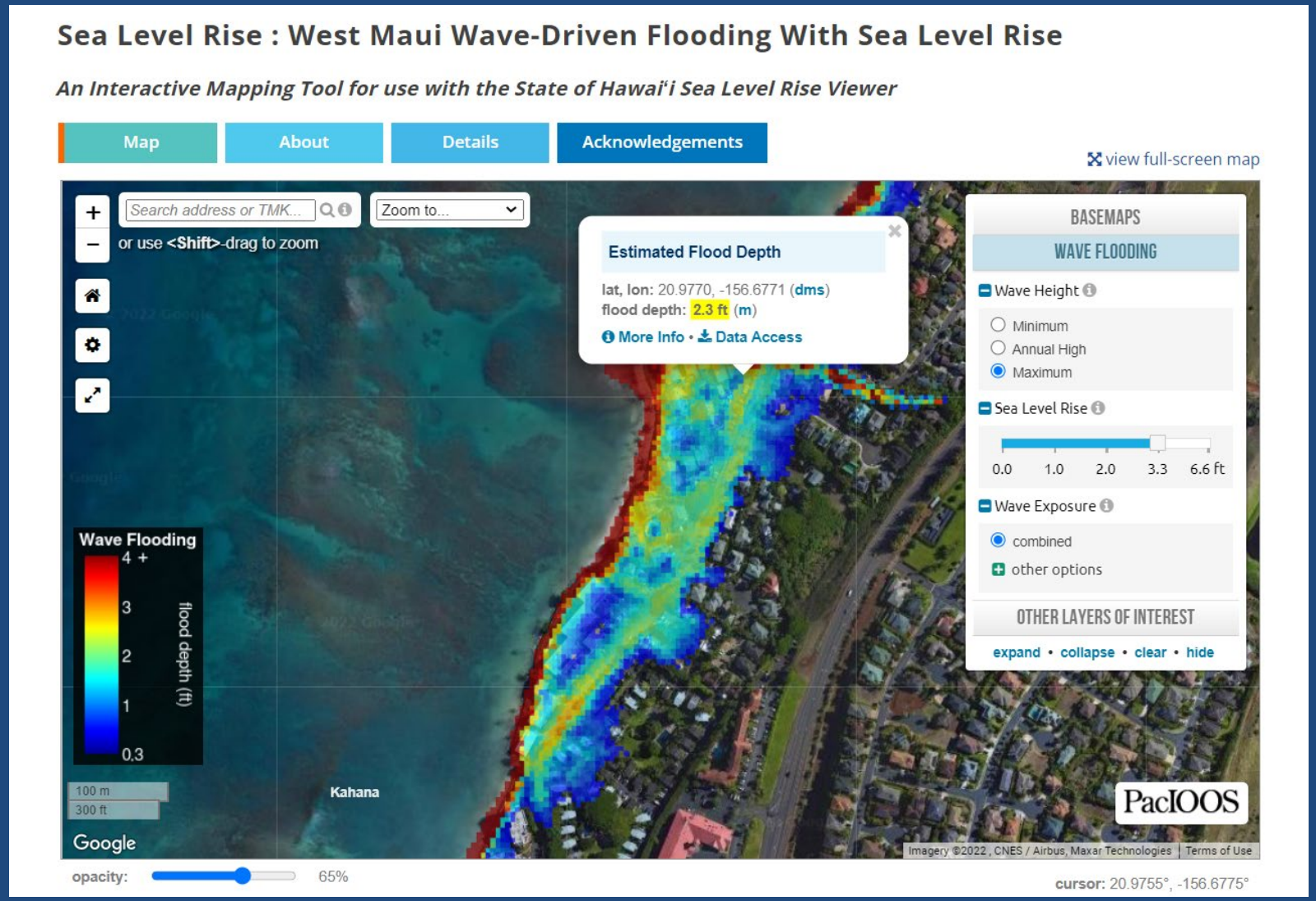

Community Supported Calibration




*www.pacioos.org/shoreline-category/runup-westmaui/*

# WEST MAUI WAVE FLOODING TOOL




Enhancements:

- More physically accurate numerical model
- Finer spatial resolution
- Flood depths provided

www.pacioos.org/shoreline-category/wm-waveflooding/

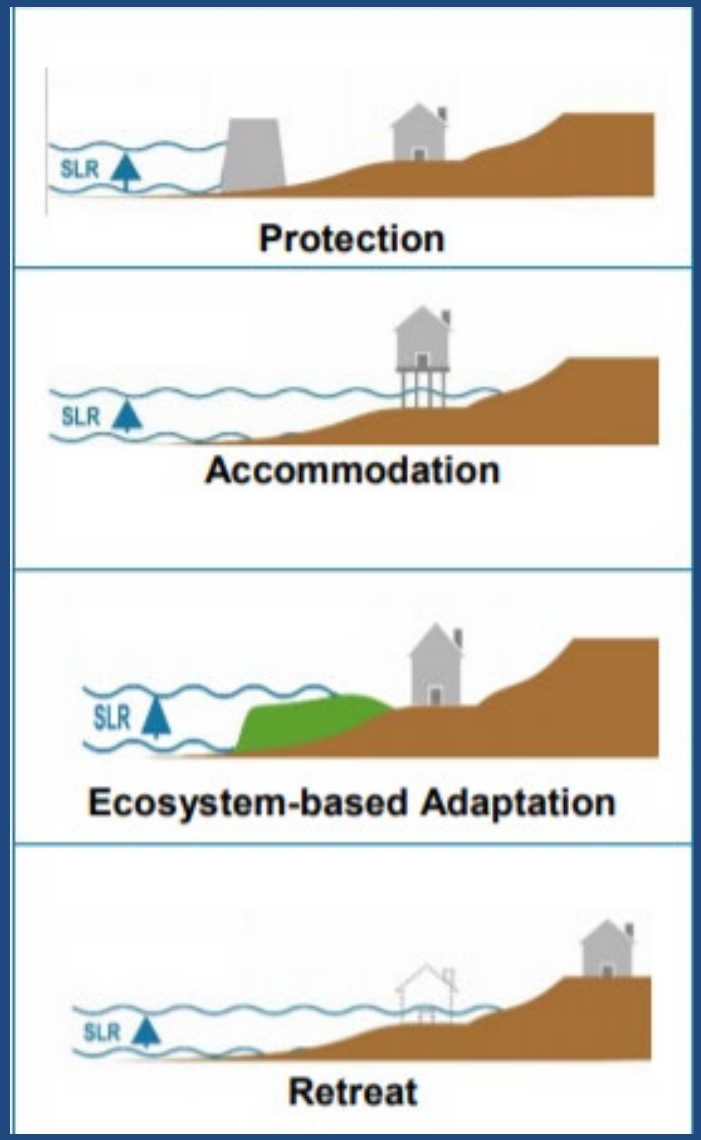
# STRATEGIES: COASTAL MANAGEMENT TOOLBOX

- Protection: Armoring
  *(i.e. permanent rock revetment or seawall)*

*preferred strategies*

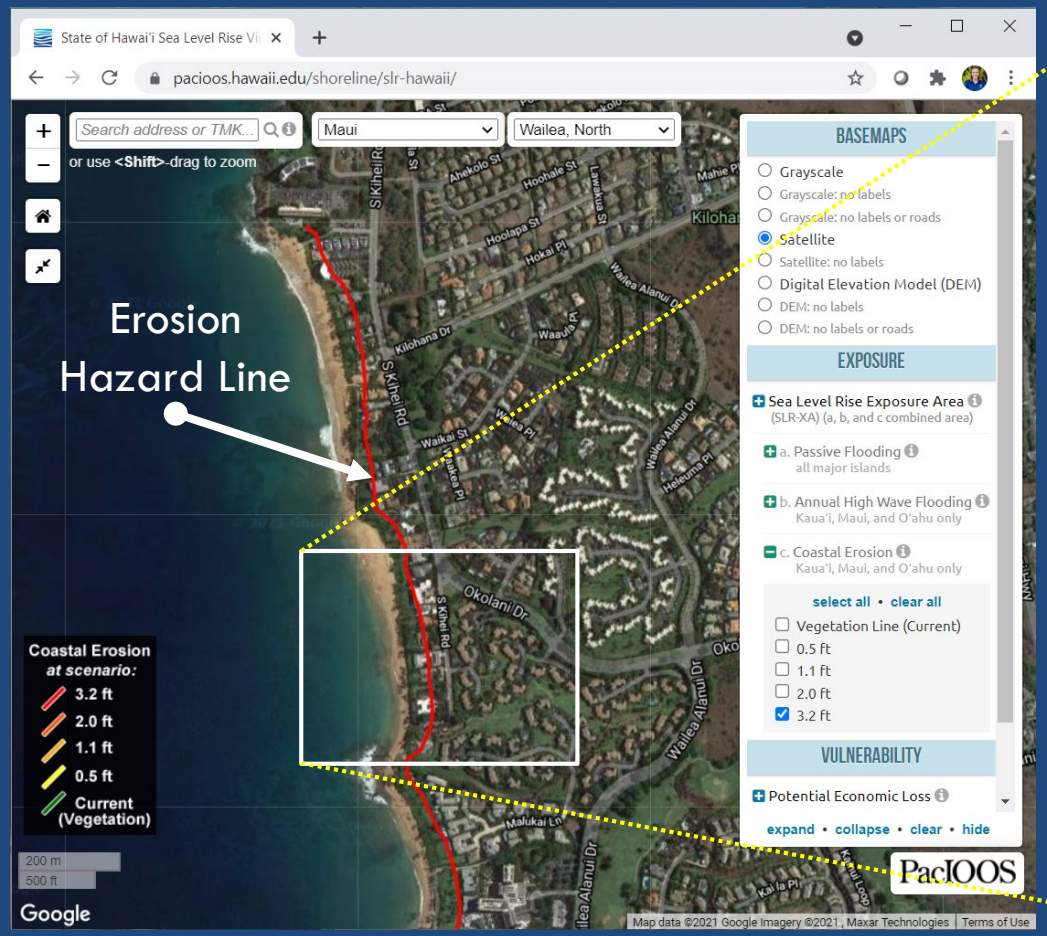
- Accommodation
  *(i.e. elevate, reconfigure)*
- Ecosystem-based Adaptation
  *(i.e. dune, beach, wetland, and coral preservation/restoration)*
- Managed retreat
  *(i.e. setbacks, relocation)*

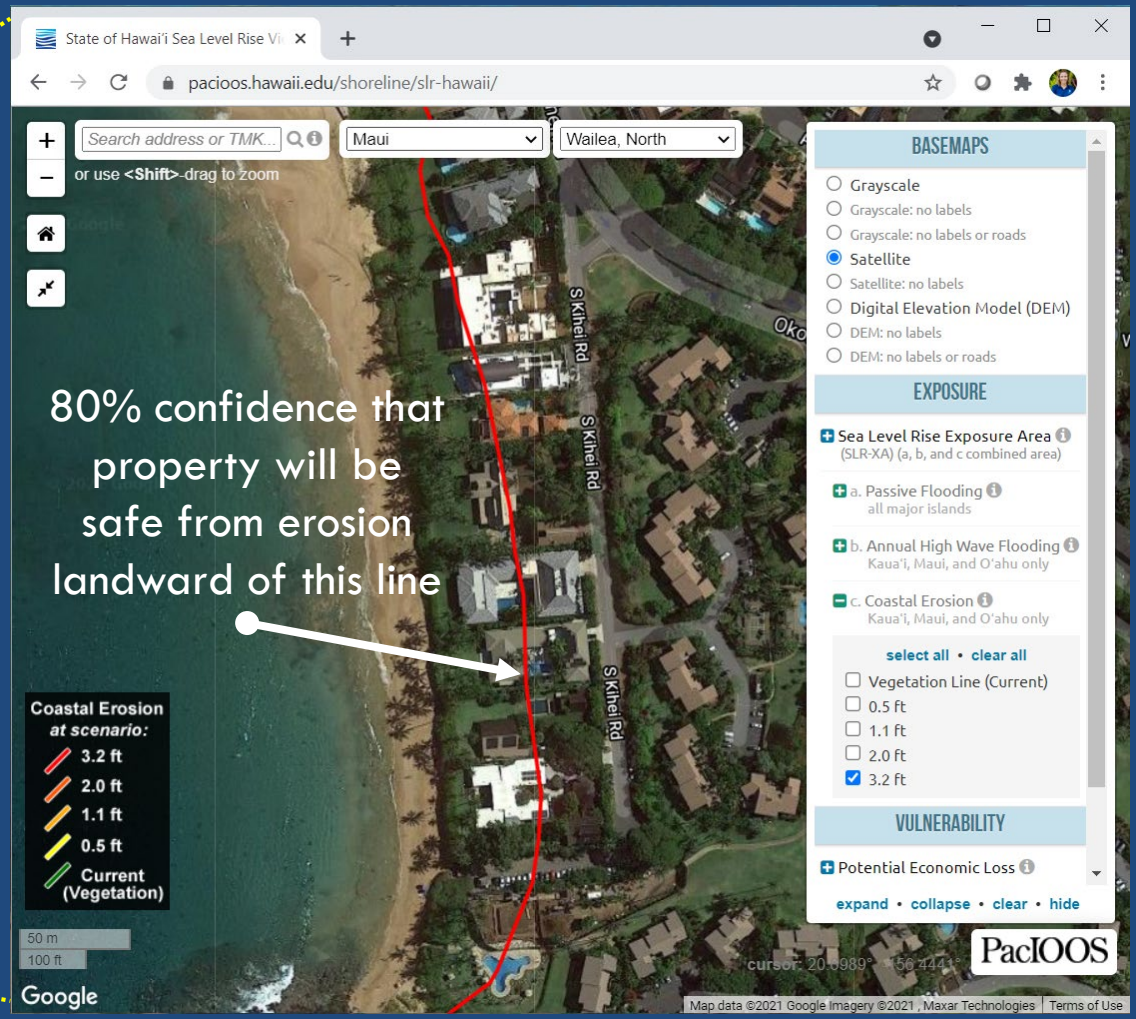
- Do nothing




# MAUI'S PROPOSED SHORELINE SETBACKS

## Proposed Shoreline Setback = Erosion Hazard Line + 40 feet



# NOAA HSRP QUESTIONS

1. **In your region, what NOAA products, data, and services are valued by your organization?**
   - Tide gage observations, especially sea level trends, predicted versus observed water levels to monitor anomalies, and high tide flooding thresholds
   - Lidar based elevation data (topo/bathy), where it exists
   - SLR predictions and guidance
   - Grant funding

2. **What new or enhanced products, data, or services would you like NOAA to offer?**
   - More tide gages everywhere -- American Samoa without for ~2 years
   - Re-benchmarking -- American Samoa is obsolete (much needed to constrain subsidence for mapping and modeling)
   - New or regularly updated elevation data -- American Samoa lacking
   - Regional map viewer of water level anomalies


Mahalo Nui Loa