

COASTAL DATA EXCHANGE

MAUI'S EROSION BASED SETBACKS



Tara Owens, Coastal Processes Specialist
University of Hawaii Sea Grant

James Buika, Shoreline Planner
County of Maui Planning Department

COASTAL HAZARDS DATA EXCHANGE



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KAHANA BAY, MAUI: November 2013

My Planning Toolbox

- County Plans
- General Plans
- Conservation District Use Permits
- Setbacks
- Shoreline Certification
- Shoreline Permits** ← *Today's Focus*
- Building Permits
- Special Area Management Permits
- Flood Zones

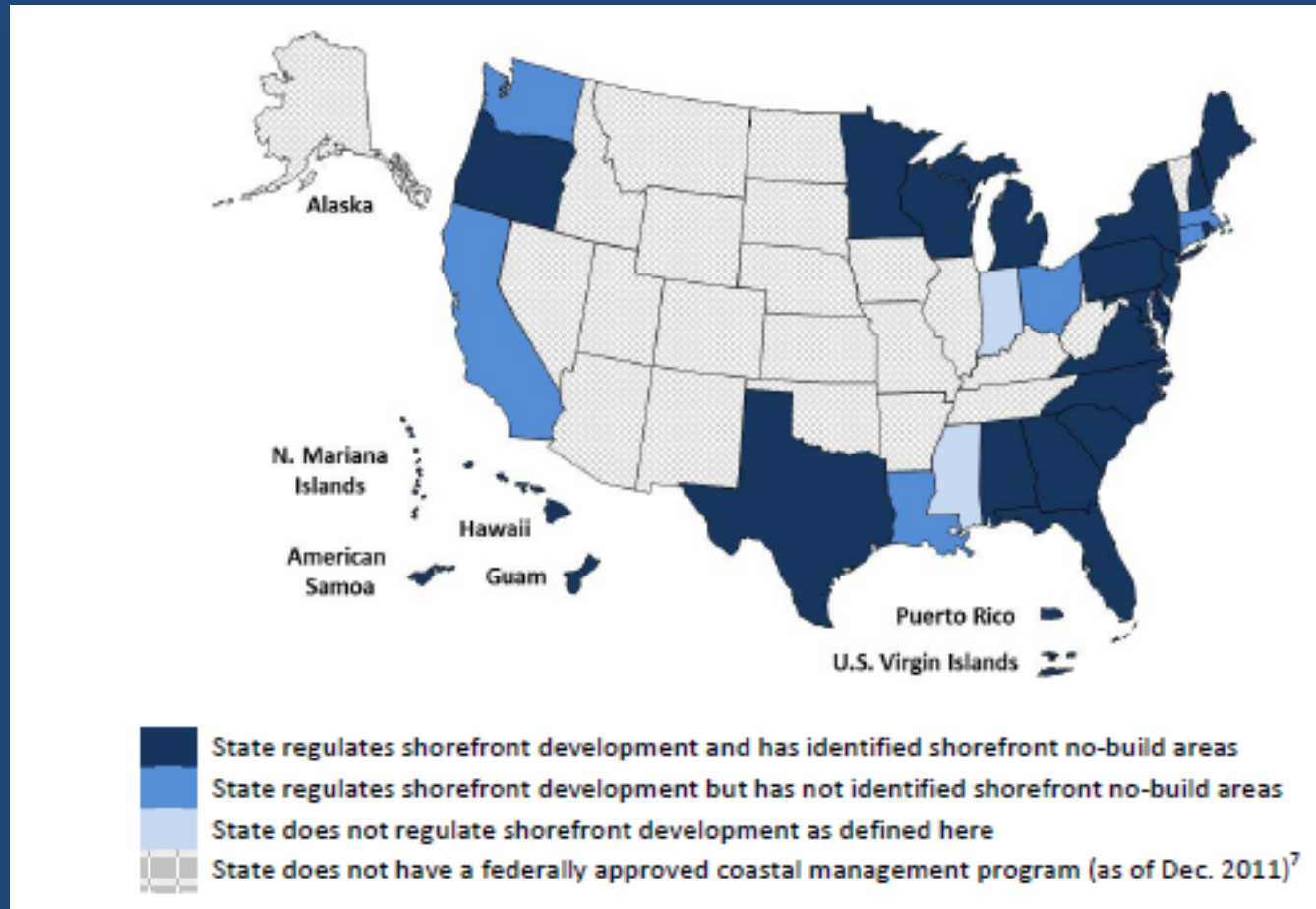


I use this planning tool to...

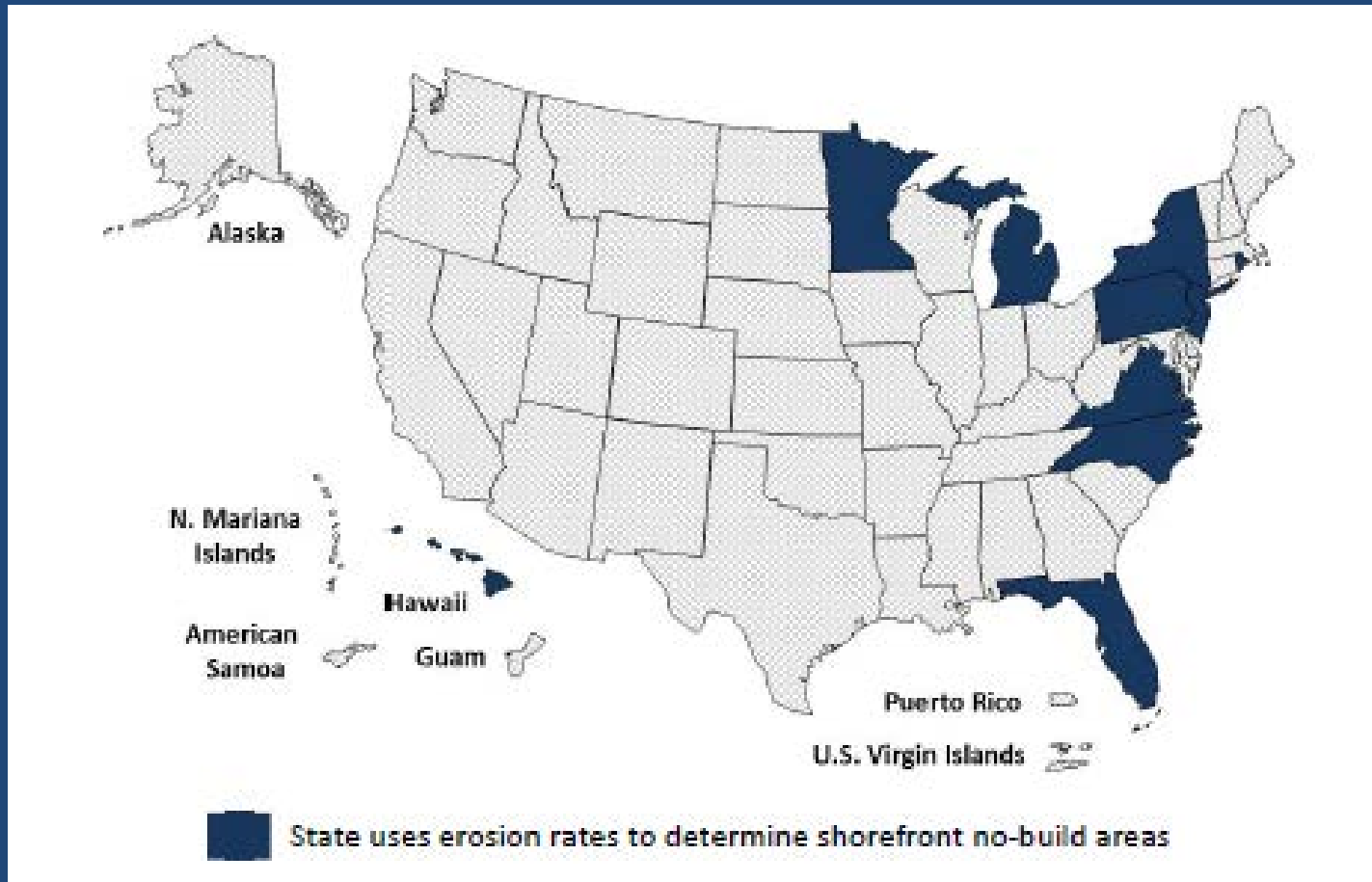
- Protect public safety
- Manage growth in a sustainable manner
- Protect the public trust
- Coordinate decisions
- Regulate shoreline activities
- Provide direction for future decisions
- Administer regulations pertaining to statute/ code



81% of the states with federally approved Coastal Management Programs (CMPs) that regulate ocean or shorefront development employ “no-build areas”.

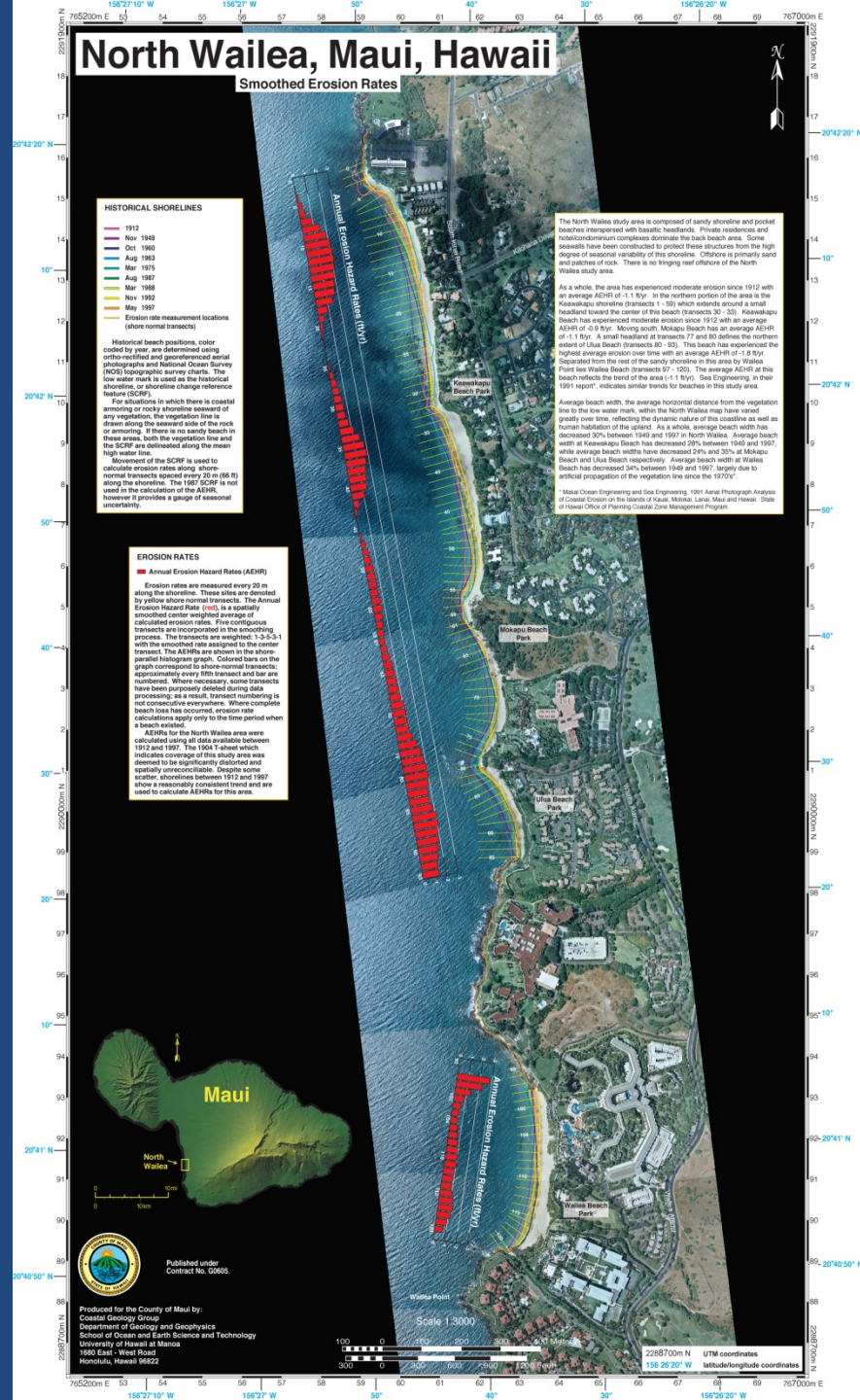


40% of the states that employ “no-build areas” are using erosion rates to delineate them.



MAUI'S SHORELINE SETBACK RULES

- MC §12-203: Shoreline Rules for the Maui Planning Commission
- Adopted November 27, 2003
- Purpose:
 - Move out of harms way
 - Plan for the obsolescence of structures in the setback
 - Ensure shoreline access
 - Limit the types of structures and activities in the shoreline area



MAUI'S SETBACK CALCULATIONS

- Setback is the greater of A or B:

A. Erosion-based Setback

Current Calculation:

50 yrs x AEHR + 25 feet

Example if AEHR = 1.4 ft/yr:

(50 yrs x 1.4 ft/yr) + 25 ft = 95

ft setback

B. Lot Depth-based Setback

Current Calculation:

<i>If lot depth is:</i>	<i>Setback is:</i>
100 ft or less	25 feet
100 to 160 ft	40 feet
160 ft or more	25% of avg. lot depth (150 ft max.)

NOTE: Minimum of 25 ft setback for all shoreline lots.

EROSION HAZARD SETBACK

$$50 \text{ yrs} \times \text{AEHR} + 25 \text{ feet}$$

1. life expectancy of structure

2. historical erosion

3. minimum setback

Hazards Not Addressed = At Risk Properties = Opportunity For Refinement:

1. 50 year multiplier too low: average life expectancy of structures = 70 years (American Society of Coastal Engineers, 2002)
2. Historic erosion rate may not adequately account for episodic events
3. Minimum setback allows structures to exist within 5 feet of “Imminent Threat” classification
4. Sea level rise not a factor

EPIIODIC EVENTS

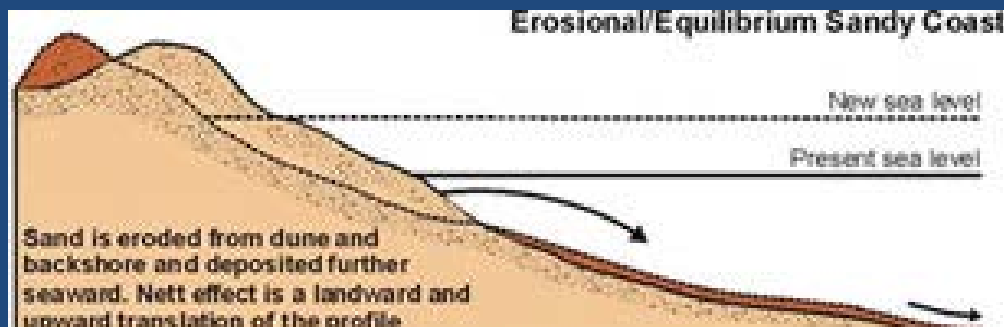
Keawakapu Beach
Erosion Rate: 0.5 ± 1.9 ft/yr



SEA LEVEL RISE

- Multiple Ways of Incorporating SLR
 - As a percentage (Coastal Hazard Mitigation Guidebook)
 - From a Simple Geometric Model (Bruun Rule)
 - SLR threshold
 - Beach Slope

Bruun Rule



Gauge: 1615680, HI, Kahului: 60 yrs
All values are in feet

Year	USACE Low	USACE Int	USACE High
2010	0.13	0.16	0.25
2020	0.20	0.27	0.49
2030	0.28	0.40	0.81
2040	0.35	0.55	1.20
2050	0.42	0.72	1.67
2060	0.49	0.90	2.21
2070	0.57	1.11	2.82
2080	0.64	1.33	3.51
2090	0.71	1.56	4.27
2100	0.78	1.82	5.11

TESTING POTENTIAL FORMULAS

Setbacks Resulting from a Variety of Formulas (sensitivity analysis)

	Low Erosion Rate (0.4 ± 0.8 ft/yr)	High Erosion Rate (2.0 ± 3.1 ft/yr)
Existing Formula (50 * AEHR) + 25	45	125
Increase Multiplier (70 * AEHR) + 25	53	165
Include Uncertainty [50 * (AEHR + UR)] + 25	85	280
Include sea level rise as percentage 50 * (AEHR x 1.1) + 25	47	135
Include 1m sea level rise from Bruun Rule (50 * AEHR) + 25 + SLR	81	161
Include 1m sea level rise from Bruun Rule & increase multiplier & add uncertainty {70 * [(AEHR + UR)] + 25 + SLR	145	418



ROCKY POINT, OAHU: December 2013



08.01.2013

CHARLEY YOUNG BEACH, MAUI: August 2013