### **RI Shoreline Change Special Area Management Plan**

### **Coastal Parcel Data Compilation for CERI:** A step closer to statewide parcels February 27, 2018





THE



COMMUNITY SECURITY: Today's extreme high tide becomes tomorrow's daily tide?





Extreme high tides (a.k.a., "King Tides") are occurring more frequently & can offer a snapshot of future sea levels



COMMUNITY SECURITY: coastal assets at risk of damage from storm surge and erosion

Historic water level markers and photo records of recent storms make it "real" and "relatable" for decision makers.





#### **Historical Hurricane Tracks**





# SEA LEVELS ARE RISING

### Newport 2.74 +/-.17mm/year



http://tidesandcurrents.noaa.gov/sltrends/

# SLR IS ACCELERATING





### http://www.corpsclimate.us/ccaceslcurves.cfm

RSLC in feet (LMSL 83-01)

# Drivers to Plan for Natural Hazards & Climate Change

- Public Health, Safety & Welfare
- Investment of Public Funds for Infrastructure
- State Mandate
- Impacts Felt at Local Level from Multiple Hazards



#### **STORMTOOLS**

#### **SLAMM**

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#### e-911 Exposure









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And Land

Tidal Marsh Vulnerability Analysis:

One Foot Sea Level Rise Model

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# www.beachsamp.org

About

Project Partners Contact Us

RI Shoreline Change Special Area Management Plan 🕴 💌 🔹 🔹											
<u>Home</u>	News	Events	Related Projects	STORMTOOLS	Coastal Erosion Maps	Management Plan	Get Involved				
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News	& Updates					÷	17, 2016 • See how	w the URI Coastal Resources Center and			

# **GUIDING PRINCIPLES**

- Develop Shoreline Change SAMP in a transparent manner
- Use best science available to understand changing conditions of Rhode Island's shoreline and help develop appropriate strategies for response
- Consider synergistic long-range impacts over time of sea level rise, coastal storms, and erosion
- Incorporate risk identification and awareness in design and development
- Early actions monitor, evaluate, & readjust
- Incremental phasing
- Maximize agency coordination and public participation
- "No Regrets" decisions

#### STORMTOOLS - Coastal Environmental Risk Index (CERI)

M. L. Spaulding<sup>1</sup>, A. Grilli<sup>1</sup>, C. Damon<sup>2</sup>, T. Crean<sup>3</sup>, G. Fugate<sup>4</sup>, B. A. Oakley<sup>5</sup>, and P. Stempel<sup>6</sup>

 <sup>1</sup> Ocean Engineering, University of RI, Narragansett, RI;
<sup>2</sup> Environmental Data Center, University of RI, Kingston, RI;
<sup>3</sup>Coastal Resources Center, University of RI, Narragansett, RI;
<sup>4</sup> Coastal Resources Management Council, Wakefield, RI; and <sup>5</sup>Eastern Connecticut State University, Willimantic, CT
<sup>6</sup> Department of Marine Affairs, University of RI, Kingston, RI

> Dune Intact No Sea Level Rise

100

Stempel 2016

Projected Percent Damage

## Goal

• To develop and apply a *Coastal Environmental Risk\*Index(CERI)* to assess the risk that structures and infrastructure face from storm surges, including flooding and the associated wave environment, in the presence of sea level rise(SLR), and shoreline erosion/accretion.

\* CERI uses percent damage (or cost of damage) associated with flooding and erosion as a proxy for risk.



### Coastal Environmental Risk Index(CERI) Studies



HUD Funded, Warwick and Charlestown, RI, Complete end May 2017

HUD Barri Warr

HUD Funded, Barrington, Bristol, and Warren, RI, May 17

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OCE Seniors, Matunuck, RI, completed May 2016; Misquamicut, RI, completed May 2017; Providence, Fox Point Hurricane Barrier In progress 2017-2018

NOAA PSM Southern RI shoreline, in planning

# **Benefits of STORMTOOLS/CERI**

- Web (publically) accessible, GIS based, widely applicable, downloadable, simple to use
- Objective, quantified analysis to assess risk(damage), using state of the art models and methods.
- Assesses damage for both structures and infrastructure.
- Risk maps to allow communication on future risks to general public.
- Explicitly considers effects of sea level rise for various time horizons.
- Risk(damage) readily converted to costs.
- Allows estimates of risk of alternative management and regulatory options.
- Consistent with current design standards for structures and infrastructure.



#### **Residential Housing Stock**

0

#### USACE StructureType

- 5A Single Story, No Basement
  - 5B Two-Story, No Basement
- 6A Single Story, Basement
- 6B Two Story, Basement
- 7A Elevated Pile Foundation
  - 7B Elevate Pile with Enclosures

Miles

0.5





















100 Year Return Period Storm No Sea Level Rise

100

Projected Percent Damage

Stempel 2016

100 Year Return Period Storm 2' Sea Level Rise

100

Projected Percent Damage

Stempel 2016



### RI Shoreline Change Special Area Management Plan



Home News	Events	Related	Projects S	TORMTOOLS	Coastal Er	osion Maps M	anagement P	lan Get Invo	olved		
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# **THE NEED: Parcels & Property Values**

0 ft Sea Level F	Rise with 100 year st	torm						
Zone	Exposed Parcels	Value Exposed (\$)	Total Parcels (Town)	Total Value (Town \$)		Percent Exposed (Town %)	Percent Value (Town %)	
Residential	478	\$ 151,992,100.00	29617	\$	5,537,244,600.00	1.6%	2.7%	
Business	297	\$ 128,165,000.00	3366	\$	1,330,766,480.00	8.8%	9.6%	
Undeveloped	24	\$ 4,300,100.00	178		699,508,100.00	13.5%	0.6%	
Other	3	\$ 23,830,100.00	31		91,013,200.00	9.7%	26.2%	
No Zone	0	\$-	2		-	0.0%	-	
Totals:	802	\$ 308,287,300.00	33194	\$	7,658,532,380.00	2.4%	4.0%	
3 ft Sea Level Rise								
Zone	Exposed Parcels	Value Exposed (\$)	Total Parcels (Town)		tal Value (Town \$)	Percent Exposed (Town %)	Percent Value (Town %)	
Residential	140	\$ 78,618,800.00	29617	\$	5,537,244,600.00	0.5%	1.4%	
Business	14	\$ 13,949,900.00	3366	\$	1,330,766,480.00	0.4%	1.0%	
Undeveloped	8	\$ 3,013,700.00	178	\$	699,508,100.00	4.5%	0.4%	
Other	2	\$ 4,450,000.00	31	\$	91,013,200.00	6.5%	4.9%	
No Zone	0	\$-	2	\$	-	0.0%	-	
Totals:	164	\$ 100,032,400.00	33194	\$	7,658,532,380.00	0.5%	1.3%	
3 ft Sea Level Rise with 100 year storm								
Zone	Exposed Parcels	Value Exposed (\$)	Total Parcels (Town)	То	otal Value (Town \$)	Percent Exposed (Town %)	Percent Value (Town %)	
Residential	640	\$ 177,237,900.00	29617	\$	5,537,244,600.00	2.2%	3.2%	
Business	348	\$ 139,739,000.00	3366	\$	1,330,766,480.00	10.3%	10.5%	
Undeveloped	31	\$ 5,843,300.00	178	\$	699,508,100.00	17.4%	0.8%	
Other	3	\$ 23,830,100.00	31	\$	91,013,200.00	9.7%	26.2%	
No Zone	0	\$-	2	\$	-	0.0%	-	
Totals:	1022	\$ 346,650,300.00	33194		7,658,532,380.00	3.1%	4.5%	

## THE PROJECT:

Shoreline Change (Beach) Special Area Management Plan: Shoreline Change Map & Parcel Data Update *Community Development Block Grant – Disaster Recovery* 

- Compile a centralized parcel dataset for 21 coastal communities in Rhode Island
- Focus on needs specific to CRMC/BeachSAMP & CERI
- Serve as a potential model for standardized GIS format to allow state agencies better access to municipal data so they can better serve, and communicate with, the cities and towns in Rhode Island.

## HOW WE DID IT:

### Greg Bonynge URI Environmental Data Center