



Buck's Landing

# Sea level rise planning and adaptation

# Sea Level Rise Vulnerability Assessment

COMPLETED JUNE 2017

ASSETS AND COMMUNITY PROFILES

- Assets
  - Parcels and buildings
  - Roads and waterways
  - Water, wastewater, stormwater, gas, electricity, and telecommunications
  - Agriculture
  - Habitats and wildlife
  - Recreation and public access
  - Emergency services
  - Historic and archeological resources
- Communities
  - 11 Cities and towns
  - Unincorporated areas



# Vulnerability Assessment

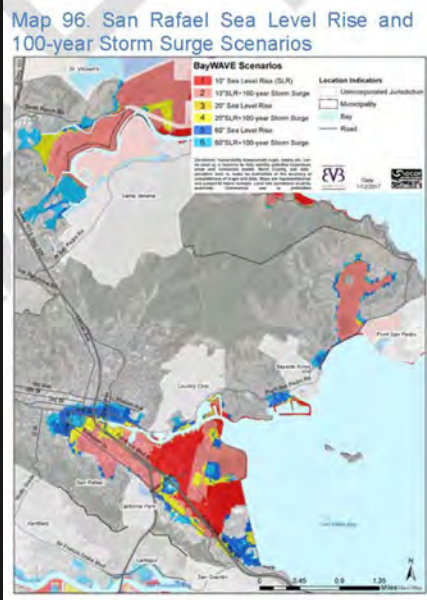


Table 104. San Rafael Vulnerable Parcels by Land Uses

Land Use	Scenarios					
	1		3		5	
	Near-term		Medium-term		Long-term	
	#	Ac.	#	Ac.	#	Ac.
Commercial Improved	116	98	213	267	419	527
Commercial Unimproved	16	89	21	108	54	149
Common Area	2	2	3	5	20	26
Industrial Improved	45	21	97	50	153	83
Industrial Unimproved	3	0.6	7	1	17	5
Residential	492	46	883	88	1,798	196
Mobile Home					154	1
Multi-Family Improved	78	34	104	44	136	54
Multi-Family Unimproved	2	0.2	3	0.6	4	1
Single Family Attached	382	5	634	10	1,084	38
Single Family Improved	20	4	127	31	390	76
Single Family Unimproved	8	3	12	3	27	26
Tax Exempt	22	53	57	193	159	530
Exemption Improved	13	6	18	10	22	12
Exemption Unimproved					1	0.5

Source: MarinMap, CoSMoS

IMPACTS AT-A-GLANCE: SCENARIO 6

2,121 acres	58,000 people
4,700+ living units	475 commercial parcels
7.5 road miles	
Storm and tidal impacts already occur	City of San Rafael San Rafael Sanitation District Property Owners HOAs Caltrans
\$2.6 billion in assessed property value; \$1.7 billion in single-family home market value <sup>12</sup>	

Table 103. San Rafael Vulnerable Residential and Commercial Parcels

Land Use	Scenarios					
	Near-term		Medium-term		Long-term	
	1		3		5	
	#	%	#	%	#	%
Residential	492	3	883	6	1,798	12
Commercial	132	11	234	19	475	40
Industrial	48	17	104	37	170	61

Source: MarinMap, CoSMoS.

Table 105. San Rafael Vulnerable Buildings by Scenario





Scenarios	Buildings	
	#	%
Near-term	1	410
	2	1,846
Medium-term	3	1,088
	4	2,097
Long-term	5	2,495
	6	3,247

Source: MarinMap, CoSMoS

# Vulnerability Assessment

Map 97. Southern San Rafael Vulnerable Buildings

## Vulnerable Assets

-  School
-  Medical Facility
-  Emergency Shelter
-  Fire Station

## Vulnerable Buildings

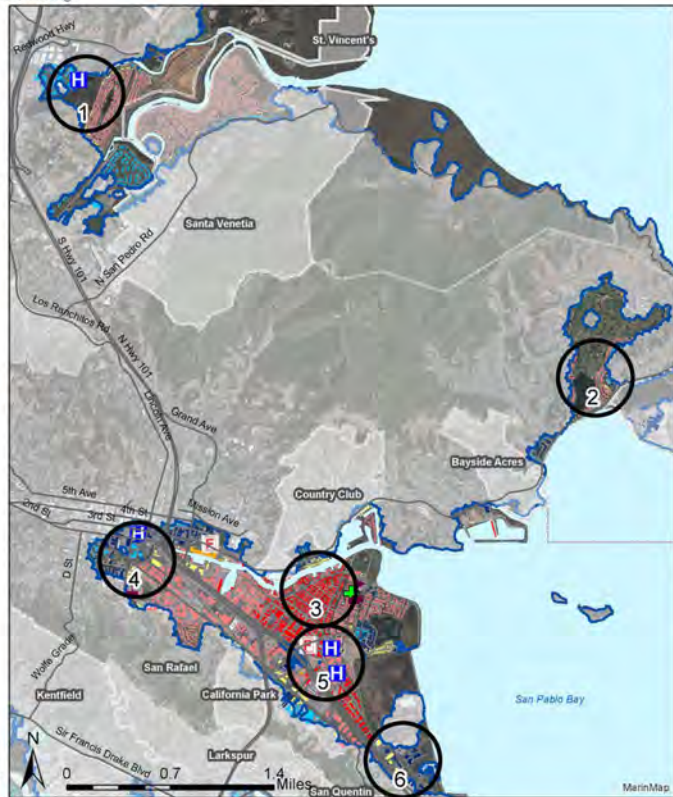
-  Scen. 1: 10" Sea Level Rise (SLR)
-  Scen. 2: 10" SLR+Storm Surge
-  Scen. 3: 20" Sea Level Rise
-  Scen. 4: 20"SLR+Storm Surge
-  Scen 5: 60" Sea Level Rise
-  Scen. 6: 60"SLR+Storm Surge

## Location Indicators

-  Unincorporated
-  Municipality
-  Road
-  Bay
-  Inland Extent: Sea Level @ 60"+100-year Storm



Date: 1/16/2017



1: Las Gallinas



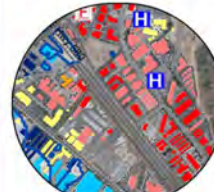
2: Peacock Gap



3: Canal Neighborhood



4: Downtown



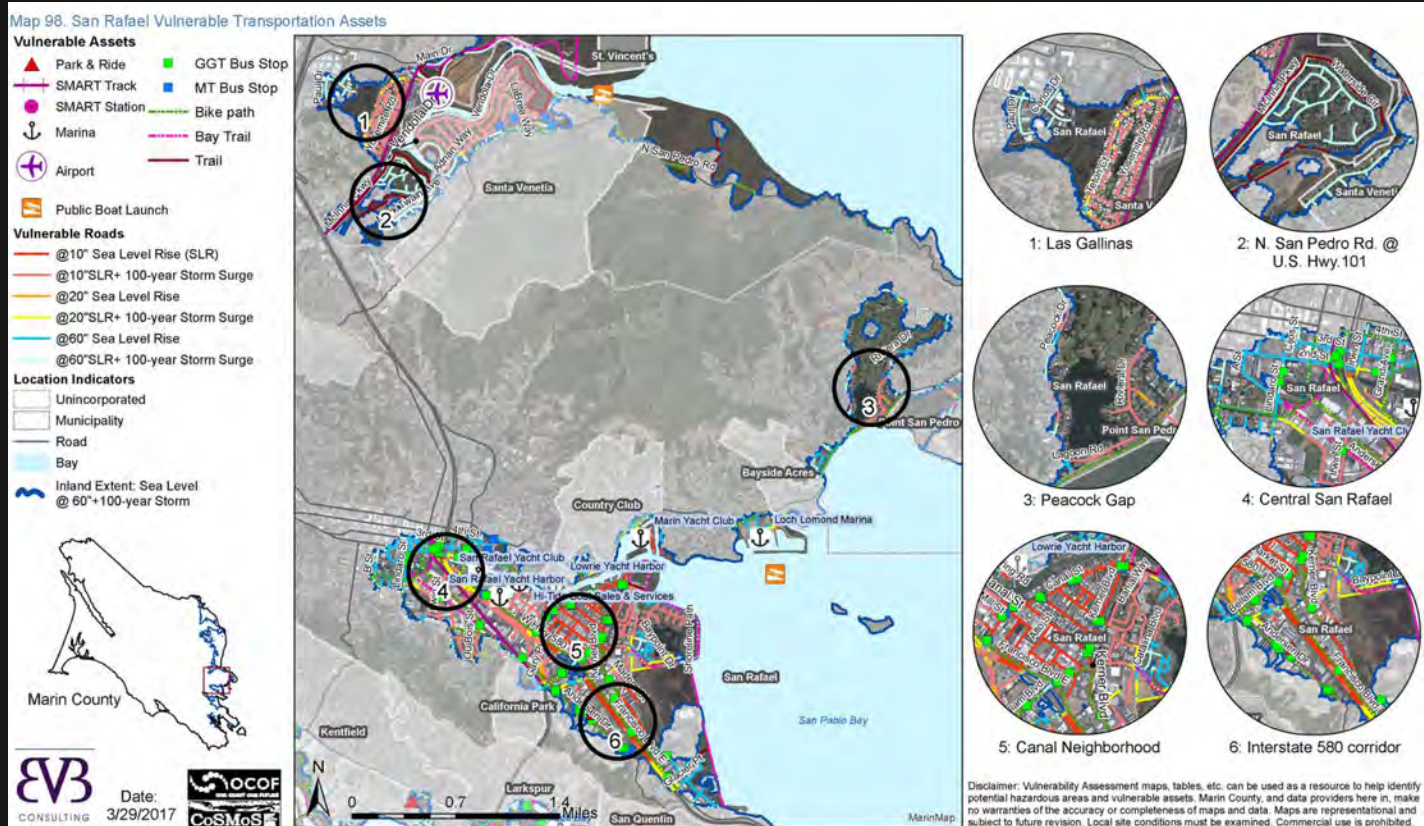
5: State Route 580



6: End of Kerner Blvd.

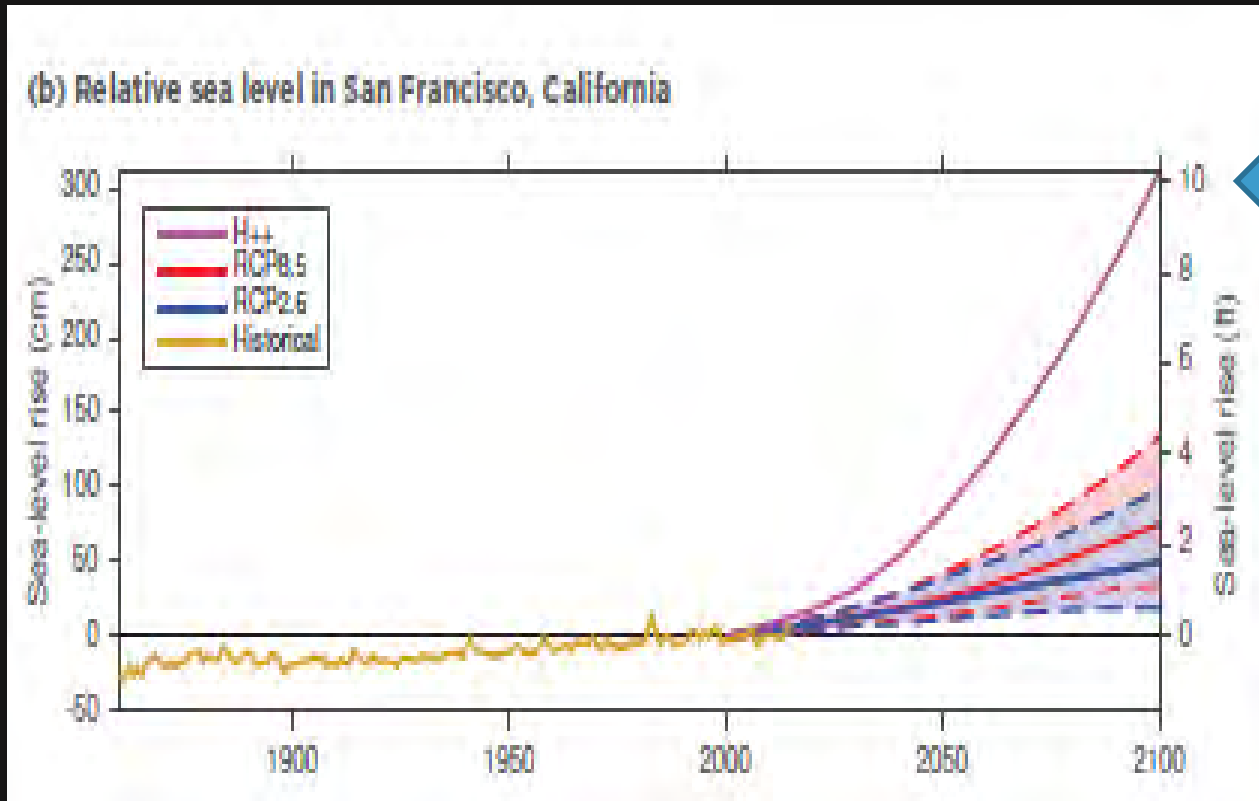
Disclaimer: Vulnerability Assessment maps, tables, etc. can be used as a resource to help identify potential hazardous areas and vulnerable assets. Marin County, and data providers here in, make no warranties of the accuracy or completeness of maps and data. Maps are representational and subject to future revision. Local site conditions must be examined. Commercial use is prohibited.

# Vulnerability Assessment





# 2017 California guidance on SLR



10 feet

# Adaptation measures

## Nature-based measures (examples)

- Subtidal habitat restoration for wave reduction (e.g. oysters, vegetation)
- Beach creation (sand, cobble, shell)
- Wetland/marsh restoration
- Pond/basin management
- Horizontal levee creation (low-slope for habitat migration and SLR protection)

## Engineered measures (examples)

- Levees, walls, pumps

## Regulatory, financial, policy tools

- Easements
- Building restrictions
- Policy changes
- Zoning changes or overlays
- Buyouts
- Transfer of development rights



# Adaptation projects in Marin

- Marin Adaptation Framework  
Evaluates the shoreline by landscape units rather than jurisdictions to identify nature-based options best suited to protect from sea level rise.
- Adaptation land use planning  
Guidance on the land use planning tools available to adapt to sea level rise
- Public works planning for local jurisdictions and agencies  
Identifies infrastructure and other capital improvement projects that can support adaptation.
- Green, nature-based projects  
Restoring and constructing wetlands and beaches



# THANK YOU

Chris Choo, principal planner with Marin County Dept. of Public Works  
473.7586 [cchoo@marincounty.org](mailto:cchoo@marincounty.org)

[www.MARINSLR.org](http://www.MARINSLR.org)

