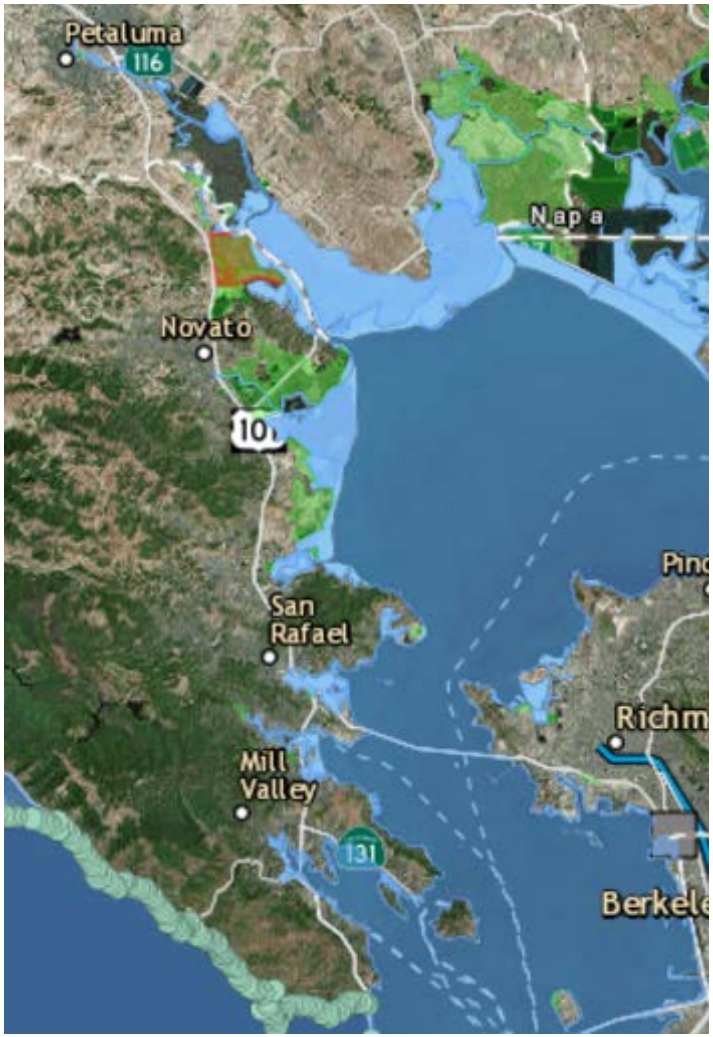
Marin County Bay Shoreline Sea Level Rise Vulnerability Assessment

Spring, 2017

Photo of Buck's Landing during King Tides flown by LightHawk

WHAT WE DID

- Marin County led a project to identify and quantify the impacts to our communities & infrastructure from sea level rise and storms
- The study involved public and private stakeholders, and coordinated with all cities and towns, as well as with local, regional, and state agencies to understand how the impacts will affect Marin's bay shoreline



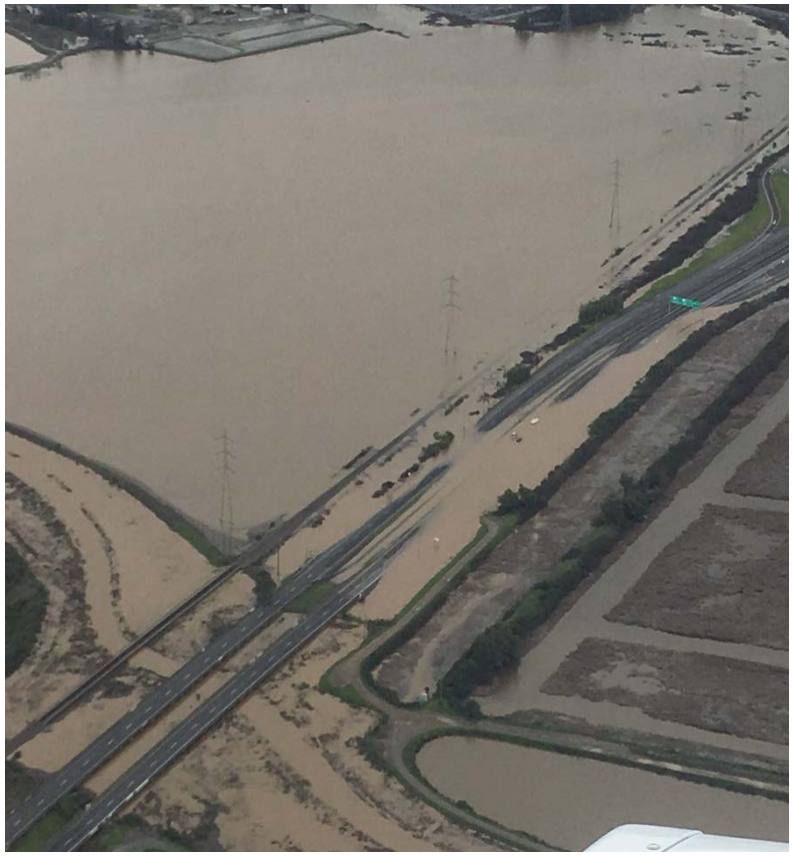
Our Coast Our Future web viewer displaying 10 inches of sea level rise with the 100-year storm, which is comparable to our winter storms

WHY WE DID IT

- Sea level rise is a slow-moving emergency that needs our attention now
- Flooding, whether from a storm event or rising seas, knows no boundaries, and we will all be affected
- Public and private collaboration is essential to address the issues we will face as a community

Storm photos from winter 2017 from Tam Valley (above) and Gallinas Creek (below)

WHY WE DID IT



Highway 37 during winter 2017 storms. The roadway was closed for a record 27 days this winter due to flooding.

- Knowing what is at risk across the region will make planning more timely and cost-effective
- The flooding that Marin already experiences will become the “new normal”
- Rising seas will make current winter flooding conditions permanent
- Our infrastructure is aging & planning replacement projects must incorporate sea level rise projections

WHAT IS A "VULNERABILITY ASSESSMENT"?

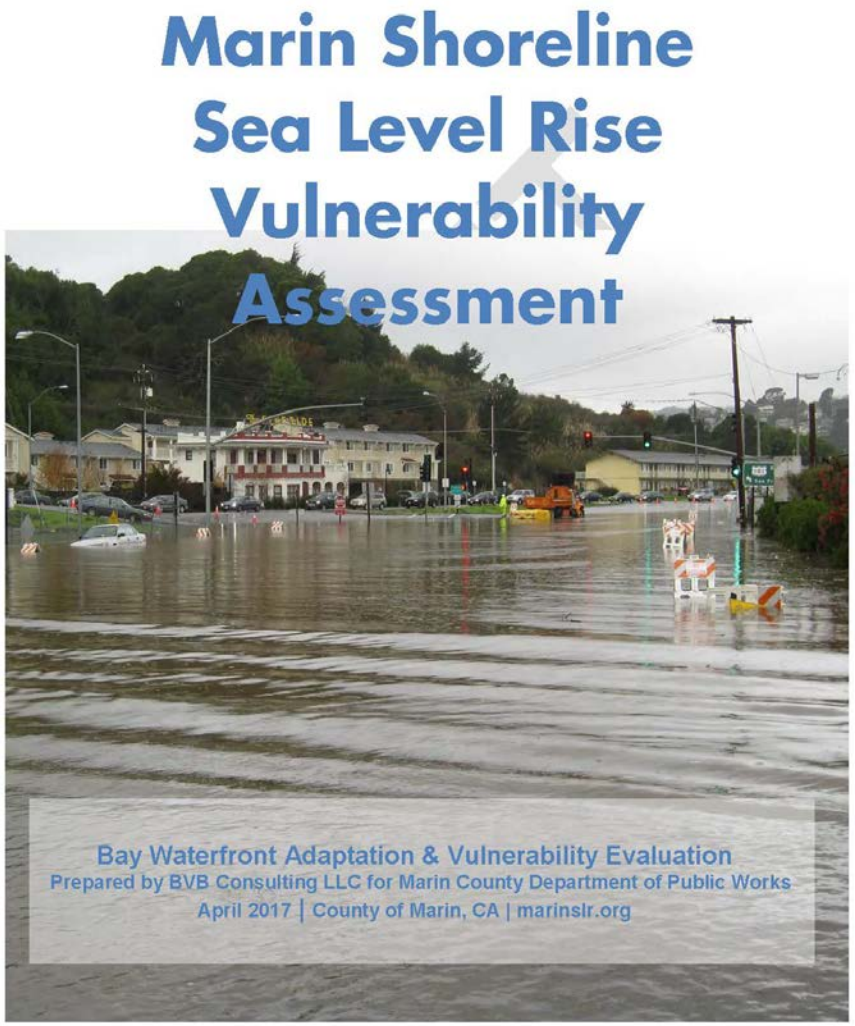
Marin County is using State guidance to assess our vulnerability to sea level rise

- Some areas can flood and "recover" with no permanent impacts, but other areas cannot sustain long-term flooding
- Vulnerability Assessments (VA) use map-based data to catalog what is exposed and how sensitive different areas are to sea level rise
- A VA builds the foundation for understanding and planning for sea level rise adaptation

MARIN'S REPORT – WHAT IT IS

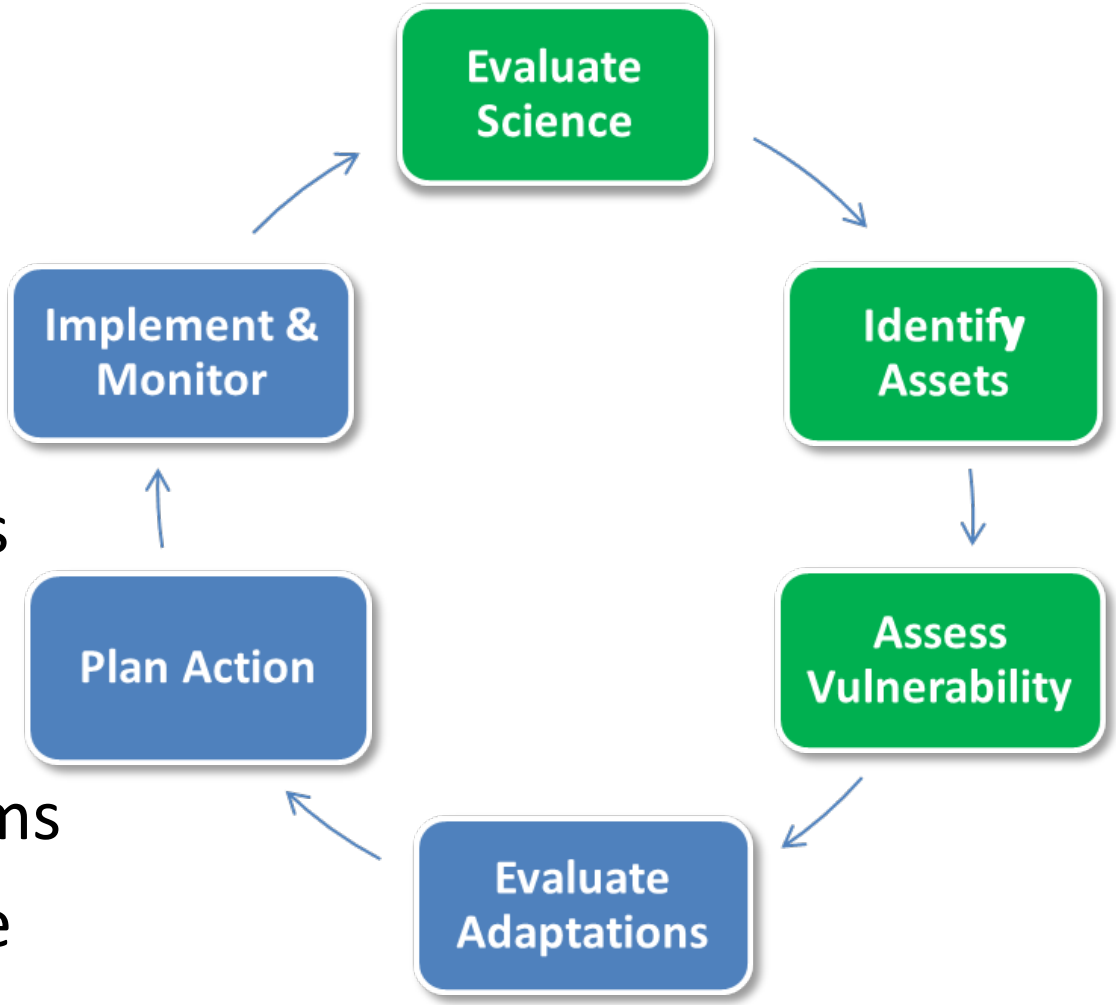
- A study of Marin's entire bay shoreline
- Incorporates the best available science combined with over 100 stakeholder interviews
- A summary of the findings, presented in two major sections: **Assets** and **Locations**

  - **Assets** include land, buildings, transportation, utilities, agriculture, habitats and wildlife, recreation, emergency services, and cultural resources
  - **Locations** identify jurisdictions, including cities, towns and unincorporated county communities

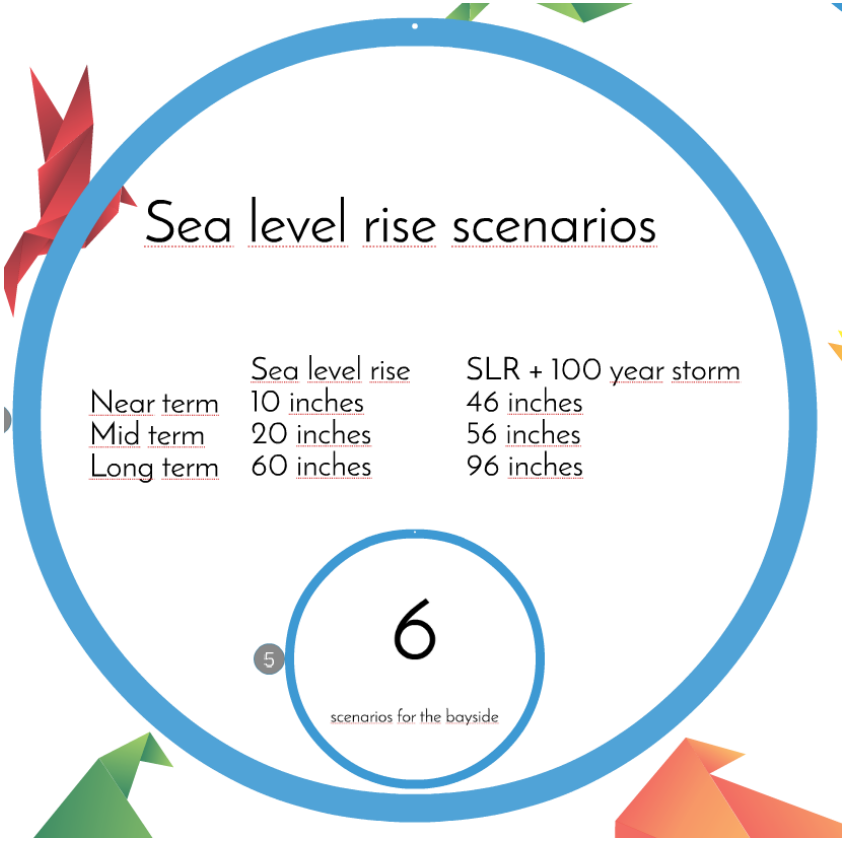


MARIN'S REPORT – WHAT IT *ISN'T*

- Does not change existing policies or regulations
- Does not prioritize areas or suggest adaptation measures
- Does not include flooding from creeks or stormwater systems
- Does not incorporate on-the-ground confirmation in the field



HOW WE DID IT



6 Sea level rise scenarios were used for the Vulnerability Assessment

- Used a statewide sea level rise model developed by the United States Geological Survey (Google: *Our Coast Our Future* to view over 40 scenarios!)
- Analyzed the impacts of 6 scenarios, ranging from 10” to 96” of sea level rise
- Described the impacts in text, graphics, and tables by individual assets and then grouped information by community

WHAT DOES IT SAY?

Impacts will extend beyond the flooded shoreline edge and will change our county in the future:

- Transportation
- Emergency services
- Water, sewer, utilities

- Many neighborhoods
- Commercial areas
- Public areas, such as beaches, wetlands and shoreline access

WHAT THIS MEANS FOR SAUSALITO

Vulnerable Assets

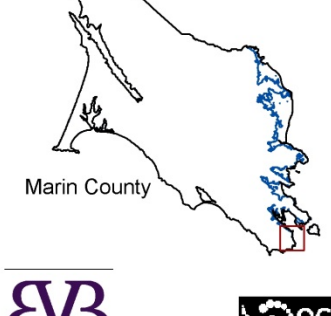
- Fire Station
- District Office

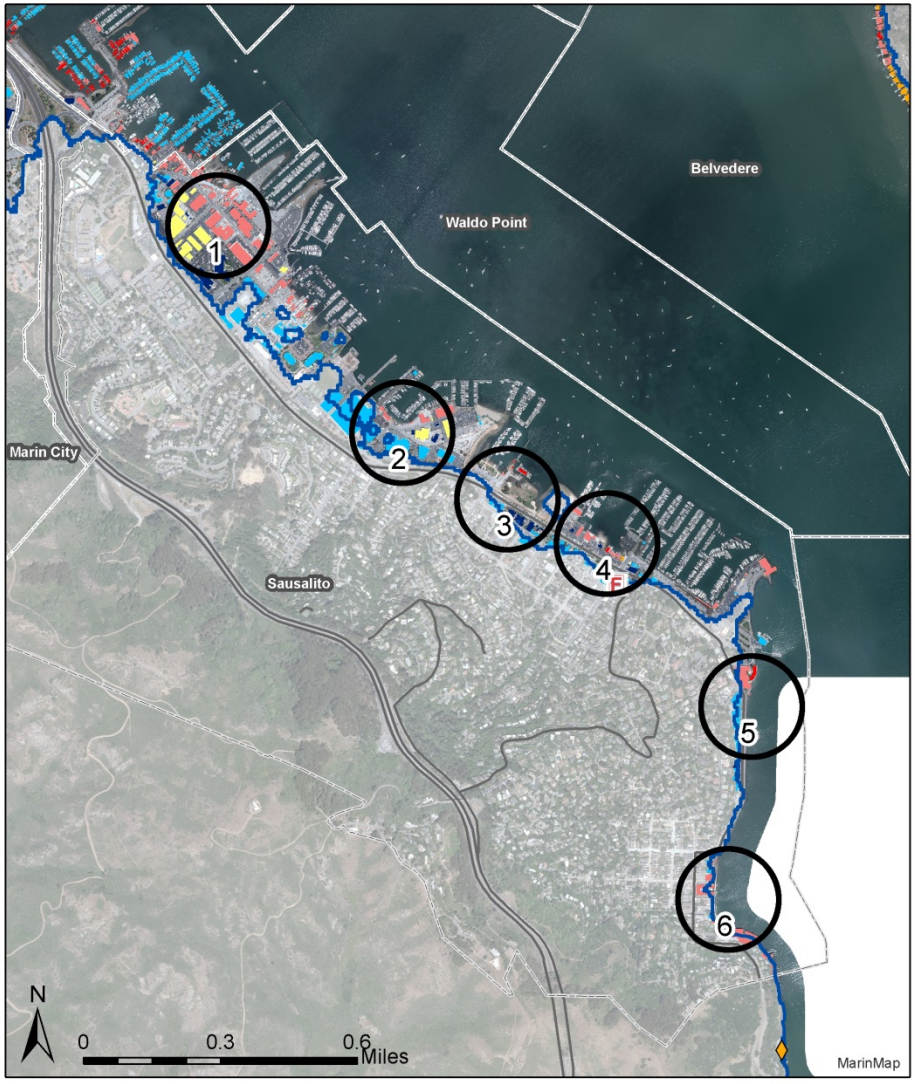
Vulnerable Buildings

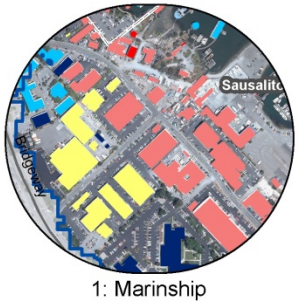
- Scen. 1: 10" Sea Level Rise (SLR)
- Scen. 2: 10" SLR+Storm Surge
- Scen. 3: 20" Sea Level Rise
- Scen. 4: 20"SLR+Storm Surge
- Scen 5: 60" Sea Level Rise
- Scen. 6: 60"SLR+Storm Surge

Location Indicators

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

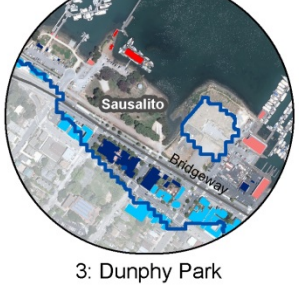




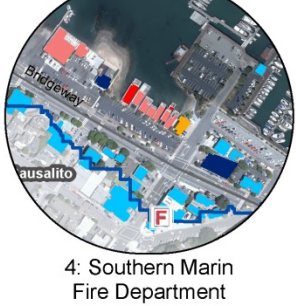


1: Marinship

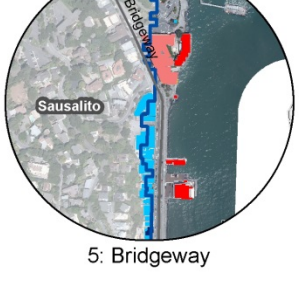
2: Libertyship Way



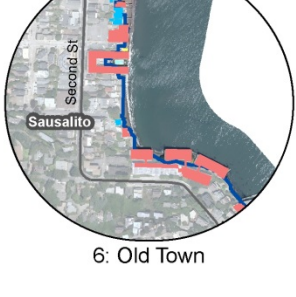
3: Dunphy Park



4: Southern Marin Fire Department



5: Bridgeway



6: Old Town

EVB CONSULTING

Date: 1/15/2017

OCOF CoSMoS

WHAT THIS MEANS FOR SAUSALITO

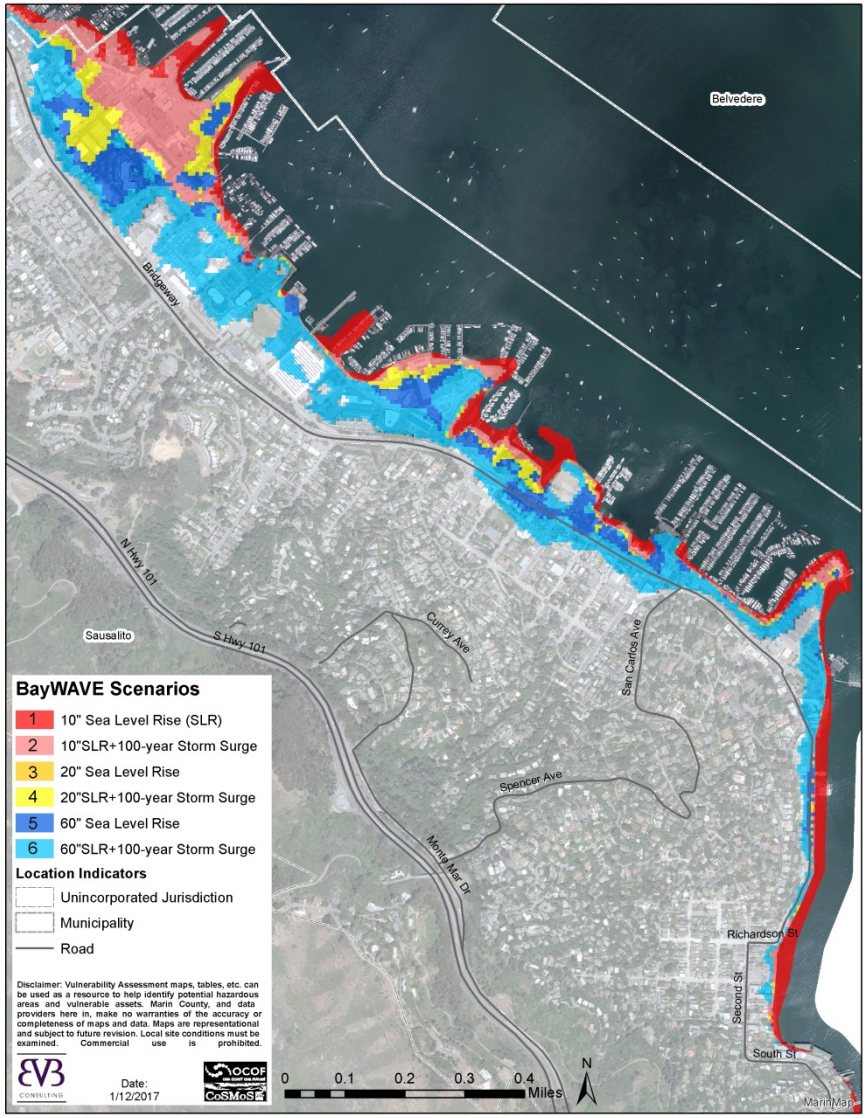


Table 50. Sausalito Vulnerable Residential and Commercial Parcels

Land Use	Scenarios					
	1		3		5	
	Near-term		Medium-term		Long-term	
	#	%	#	%	#	%
Residential	9	0	11	0	12	0
Commercial	4	2	6	3	18	10
Industrial	3	21	8	30	41	62

Source: Marin Map, CoSMoS

IMPACTS AT-A-GLANCE: SCENARIO 6

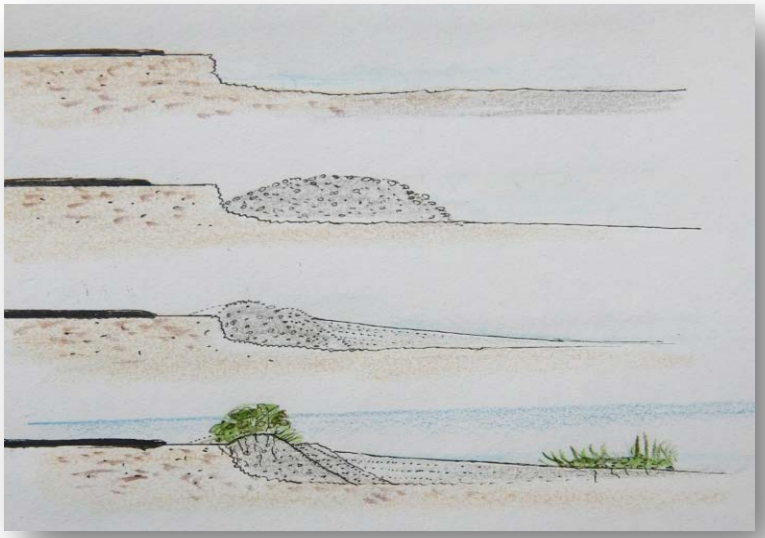
- 150 acres
- 265 living units
- 3.5 miles of roads
- Extreme event impacts already occur
- $400 million in assessed property value, $61,000 in single-family home market value[1]
- 7,000+ people
- 18 commercial parcels
- Property Owners
- City of Sausalito
- SMCSD
- Southern Marin Fire District
- GG's Sausalito Ferry

WHAT DID WE LEARN?

- There is no “one solution” that will “fix” everything
- There is a lot to do!
- There is a lot we CAN do, especially if we start planning *now*
- We’re in this together

WHAT'S HAPPENING NOW

- Adaptation pilot projects are already underway to test solutions, more are coming
- County staff continues to collaborate with communities & support adaptation planning and projects
- Public review draft is available
- Written comments due by May 29th to Chris Choo, cchoo@marincounty.org



Shoreline erosion in concept drawing by Peter Baye (above) and after construction at Aramburu Island (below)

WHAT'S NEXT?

Looking north from Richardson Bay near the Sausalito on-ramp to northbound Highway 101 in winter 1973

- Planning for adaptation will occur over time and will involve the public and multiple agencies and jurisdictions
- Please read the study and stay involved by signing up for email updates
- Participate in developing local solutions

Thank you

www.MarinSLR.org