



Shoreline Highway at Highway 101. Credit: Caltrans

Sea level rise: Marin County

Our watery history

Flood experience, lots of it....

What happens when it floods?

Flood types



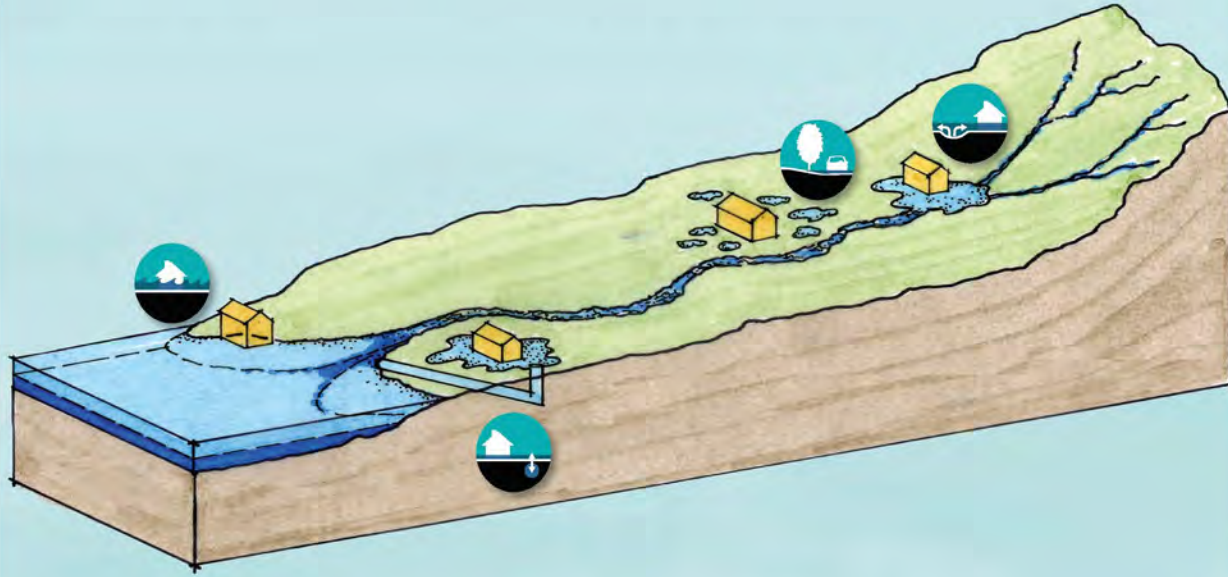
TIDAL INUNDATION Rising tides fill creeks and flood lowlands

Extreme high tide events exacerbate creek or stormwater overflow during storms. High tides can back up stormwater pipes and prevent non-tidal areas from draining. Sea level rise will increase the extent and frequency of tidal inundation.



STORMWATER OVERFLOW Stormdrains back up

Stormwater drainage systems quickly convey rainwater through underground pipes to creeks and the Bay. When the stormdrains are obstructed or broken or when the creeks that they lead to are already full, water backs up onto the streets.



ISOLATED PONDING Pools form on the ground

Isolated ponding can occur in any area that doesn't drain effectively – for example, in a natural depression in the landscape.



CREEK OVERFLOW Creeks spill over their banks

Naturally, waterways regularly overflowed onto an adjacent flood plain. Buildings are now often located on these flood plains. The size and slope of a channel, blockages, proximity to the bay, and constrictions obstructing flow such as bridges, utility pipes, or adjacent buildings all influence the frequency and volume of creek overflow.

Laurel Way
1982





Ross Drive
1993



Highway 1 at 101
2014

Miller Avenue
2016



Three feet of sea level rise



Is it really that bad?

We can fix it, right?

Earth's global surface temperature in 2019

2ND WARMEST SINCE RECORDS BEGAN IN 1880. 2016 WAS THE HOTTEST 1.69 F



Oceans absorb this heat

THE TOP 328 FEET HAS WARMED 0.6 DEGREES FAHRENHEIT SINCE 1969



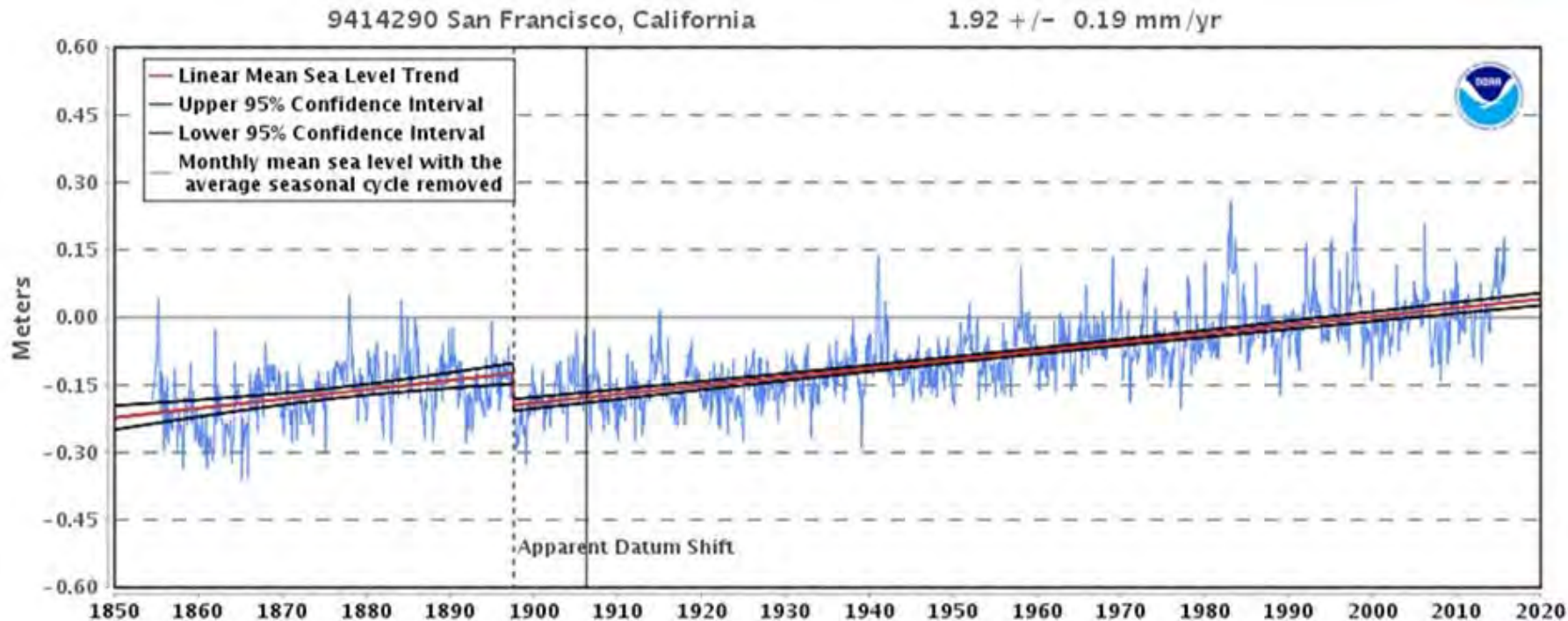
Loss of ice from polar caps and glaciers

GREENLAND LOST AN AVERAGE OF 279B TONS OF ICE PER YEAR BETWEEN 1993 AND 2019

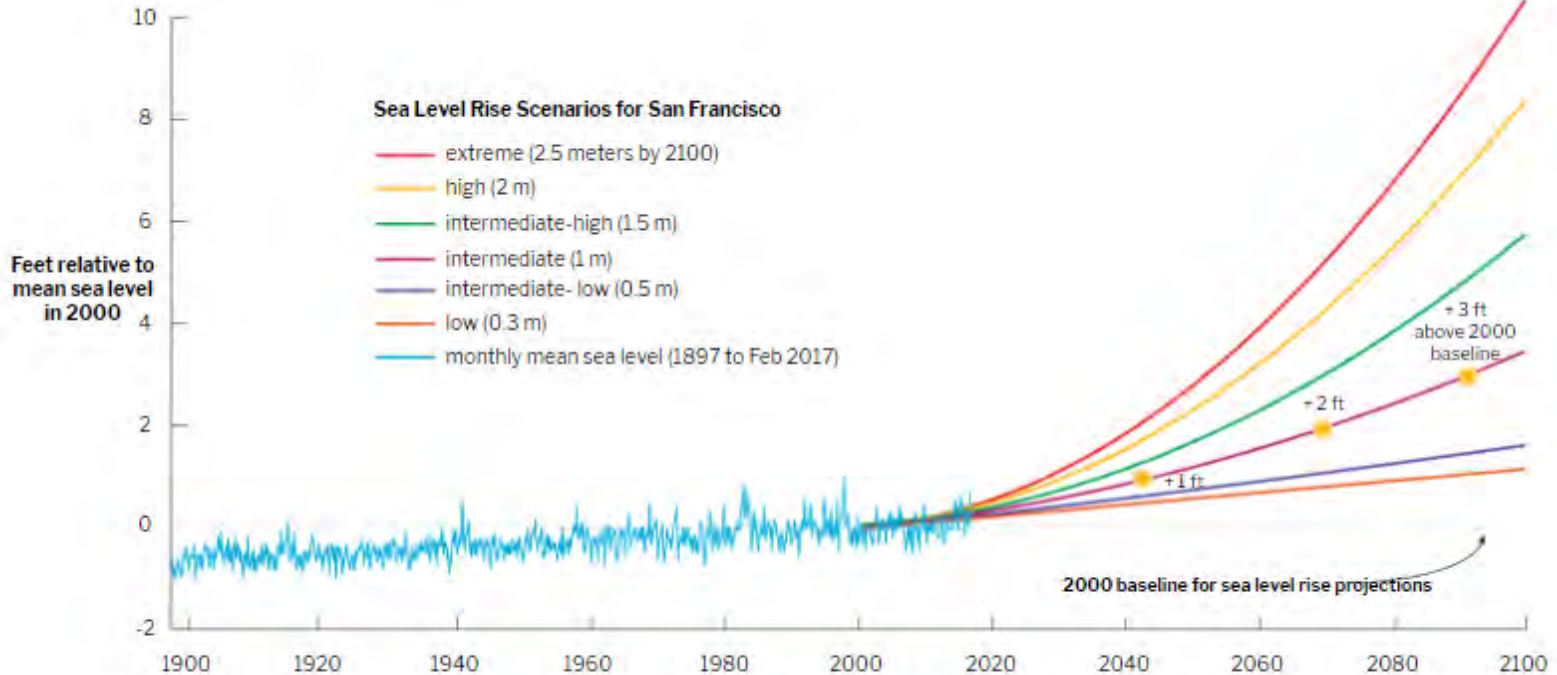


Sea level rise locally

8 INCHES OF SEA LEVEL RISE IN SF BAY



Emissions (greenhouse gas) vs. sea level rise



Sea level rise projections for San Francisco for several global scenarios, based on global projections from a 2017 NOAA technical report

Sea Level Rise Vulnerability Assessment

COMPLETED JUNE 2017

ASSETS AND COMMUNITY PROFILES

- Assets
 - Parcels and buildings
 - Roads and highways
 - 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



What do we know?

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

- Transportation, emergency services, water, sewer and other utilities, as well as many neighborhoods, commercial areas, and public areas like beaches, wetlands and our access to the water



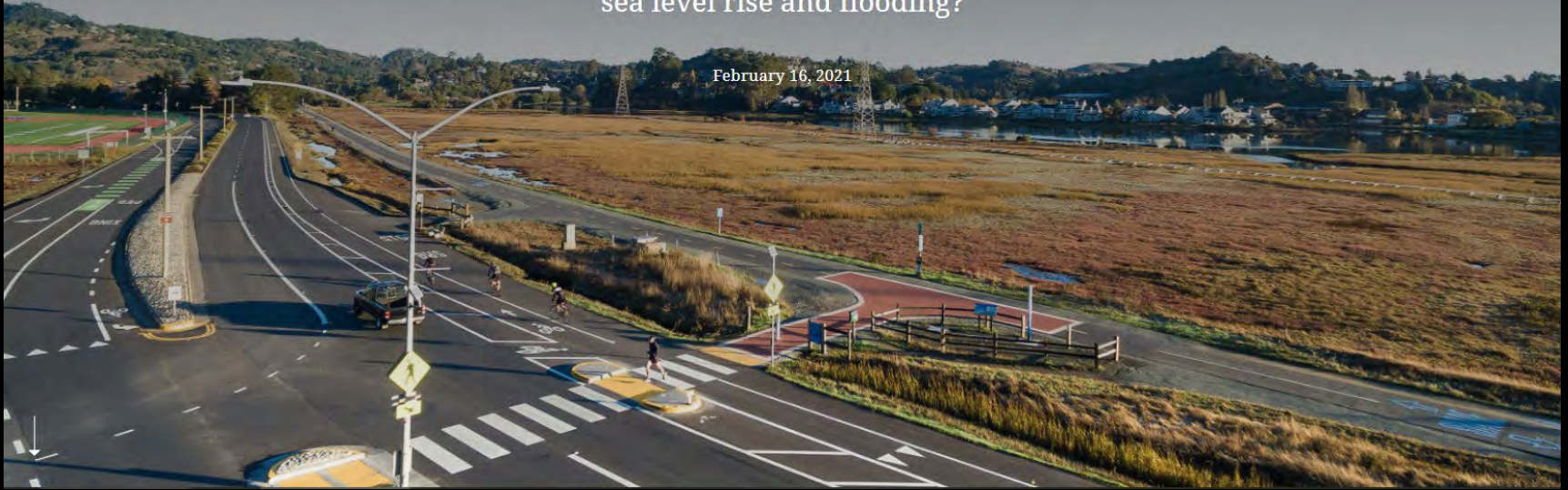
Marin rises together

The time to act is now

Richardson Bay Resilience

What is the County of Marin doing to plan for the impacts of climate-induced sea level rise and flooding?

February 16, 2021



[Link to story map](#)

THANK YOU!

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