



THE TOWN OF
Corte Madera
California

Climate Adaptation Plan



May 8, 2018

Shoreline Discussion Agenda

6:30 pm Snacks and Conversation

Opportunity to gather, grab a snack, and get settled

6:40 pm Introduction and Meeting Objectives

Brief welcome and overview of the project

6:50 pm What does it mean for the Town of Corte Madera to be Resilient?

Group discussion

7:10 pm Climate Adaptation Plan – Process and Shoreline Risks

Brief presentation on the Adaptation Plan and current and future shoreline risk.

7:25 pm Key Focus Areas and Concerns (Breakout Session)

- When does weather go from a nuisance to a problem in your neighborhood?
- What are the biggest climate change concerns for the Town in 20-years?
- Has your neighborhood already taken action to be better prepared for the future?
- What opportunities do you see to enhance that preparedness?
- How does action now help us achieve our vision of resilience?

8:15pm Wrap-up and Next Steps

The survey and other opportunities for input
Help spread the word and stay involved

8:30 pm Adjourn



Introductions





NEWS NORTHERN CALIFORNIA WILDFIRE

Toxic SF air quality gets worse

"Unhealthy" conditions continue

By Adam Brinklow | Nov 15, 2018, 8:12am PST

f t SHARE

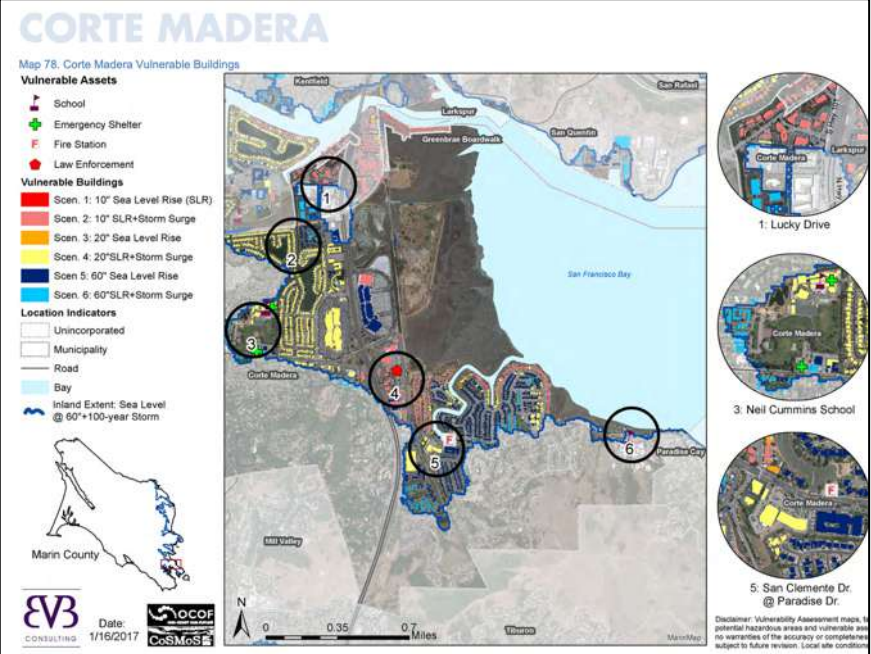
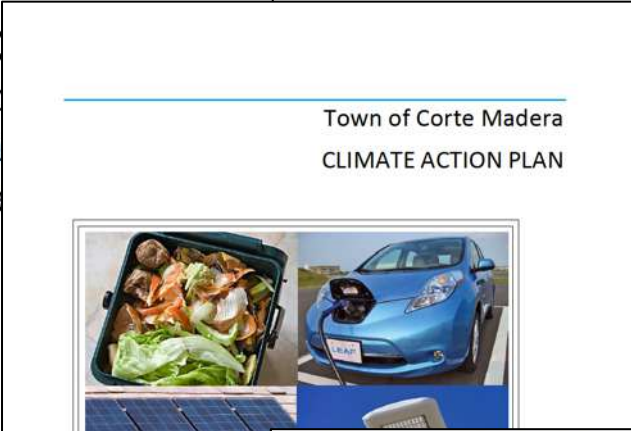
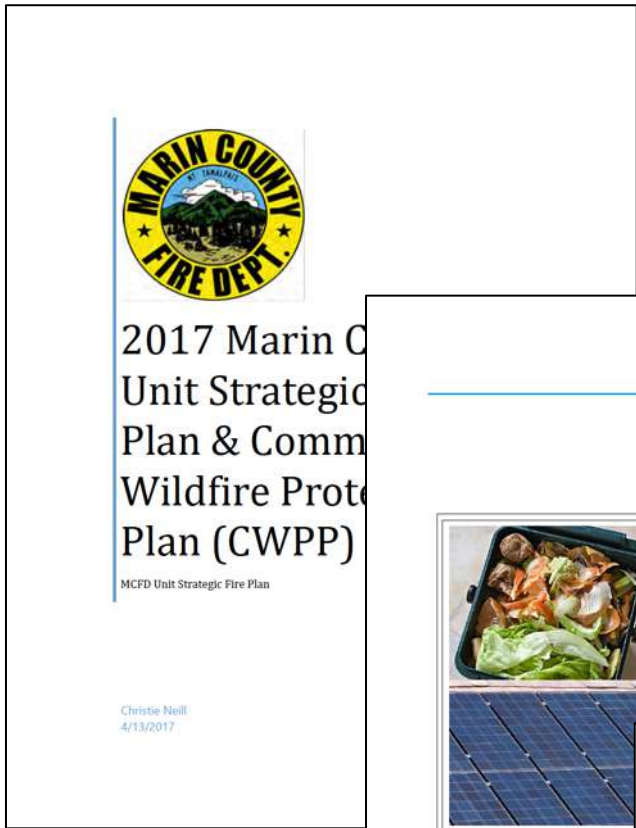
The Mercury News N



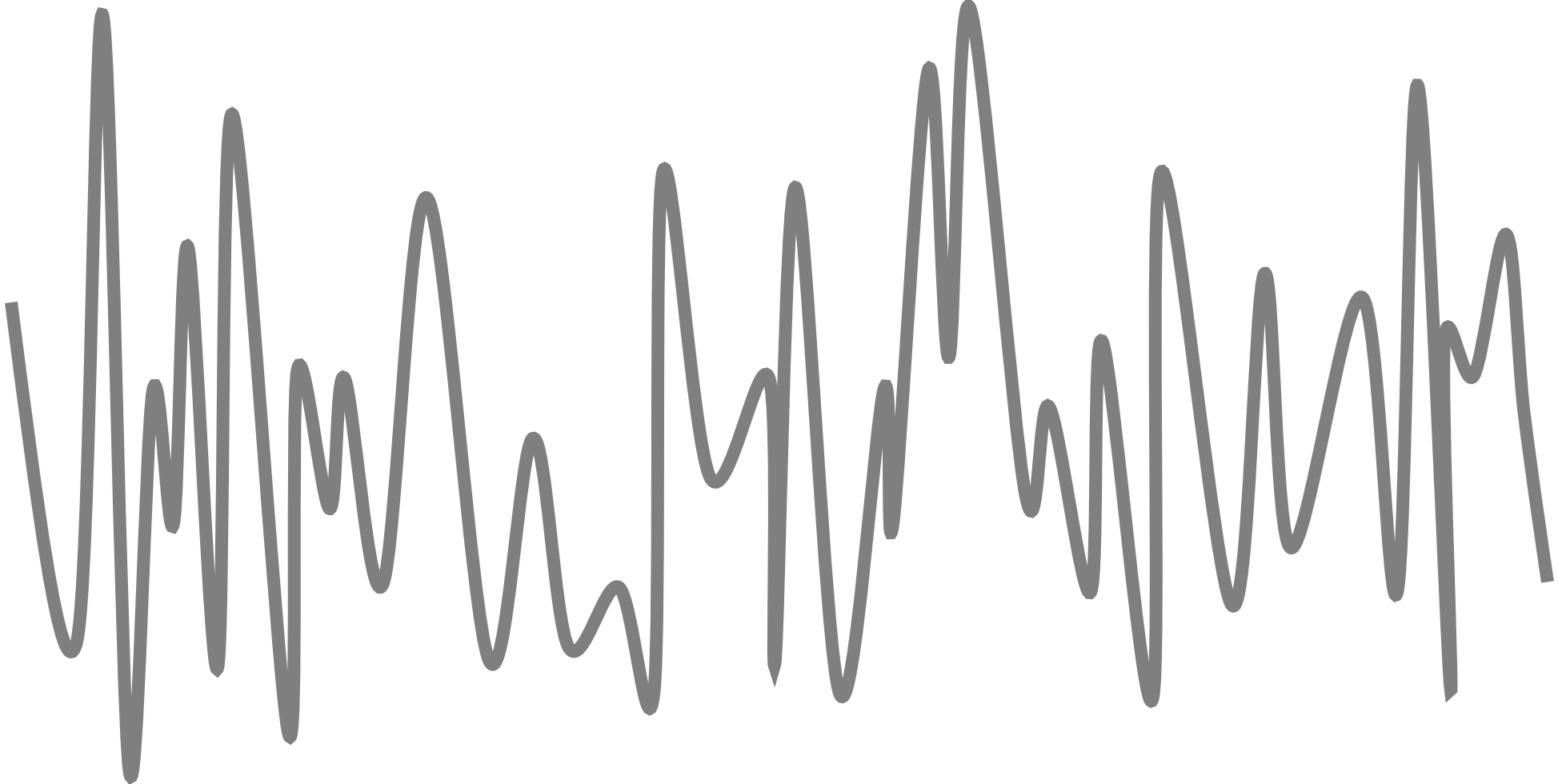
Photo by Justin Sullivan/Getty Images

Update: AQI now at purple with a score of 211—worse than this morning when the air was level red at 177.

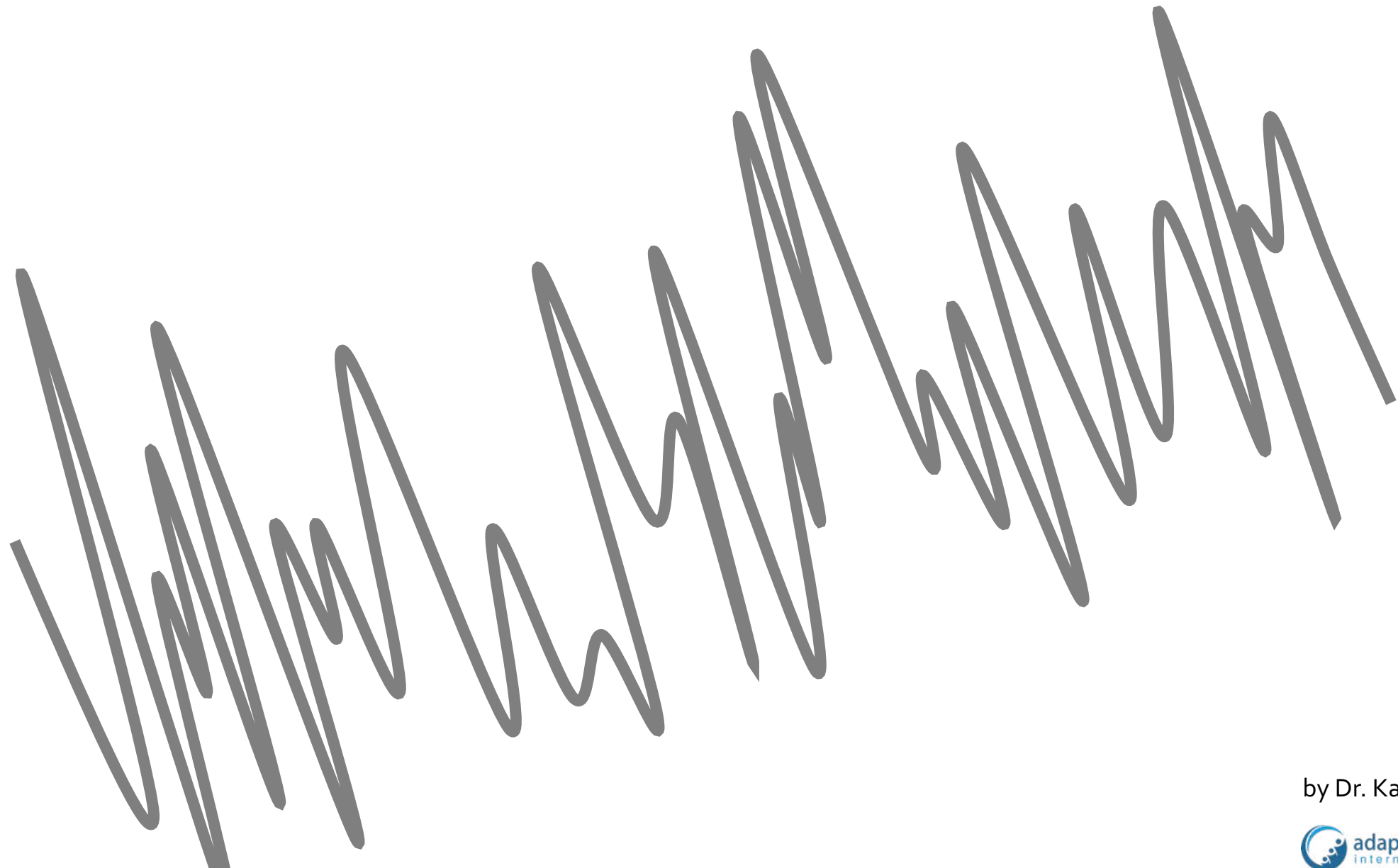




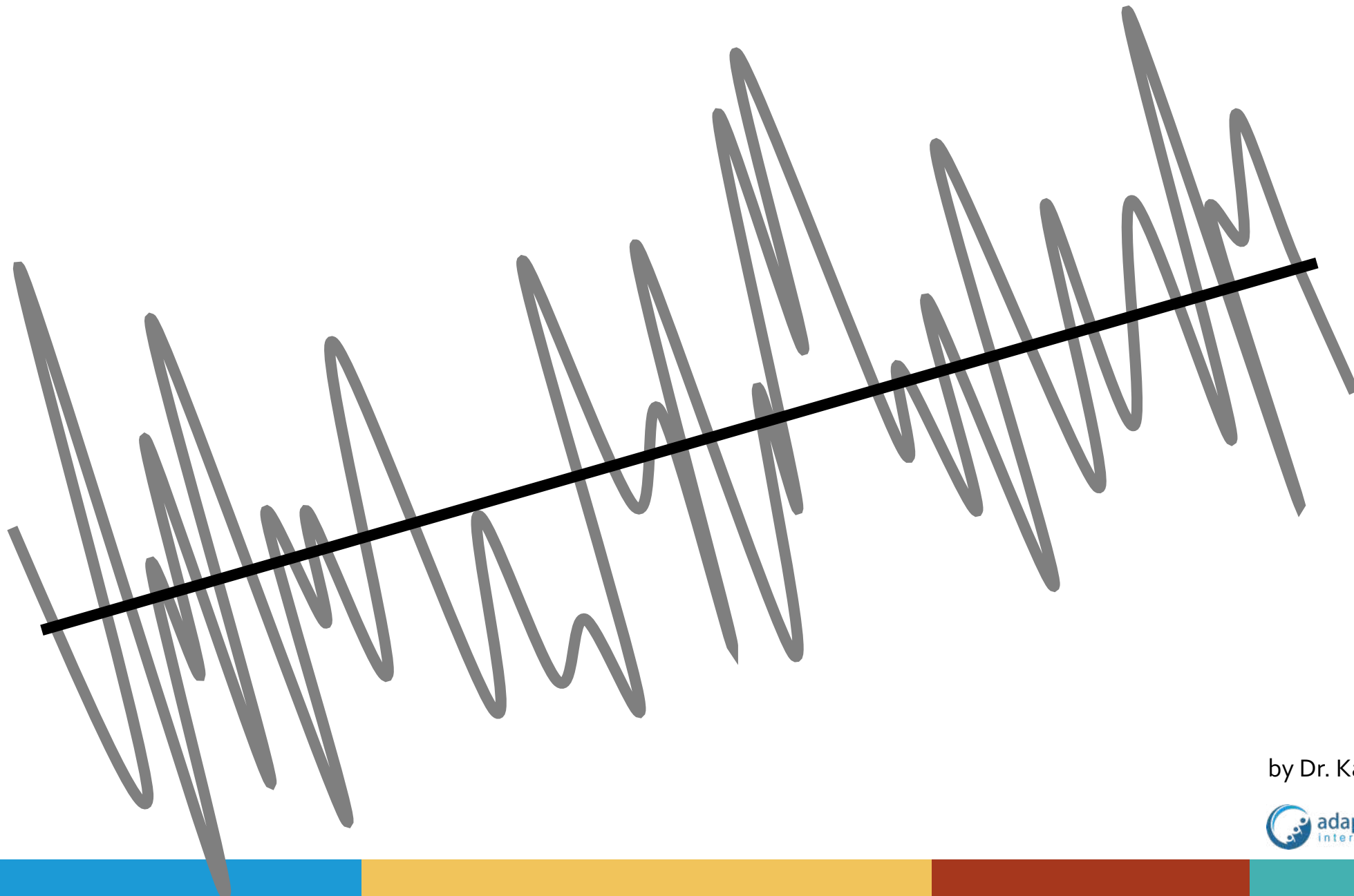
Climate and Weather



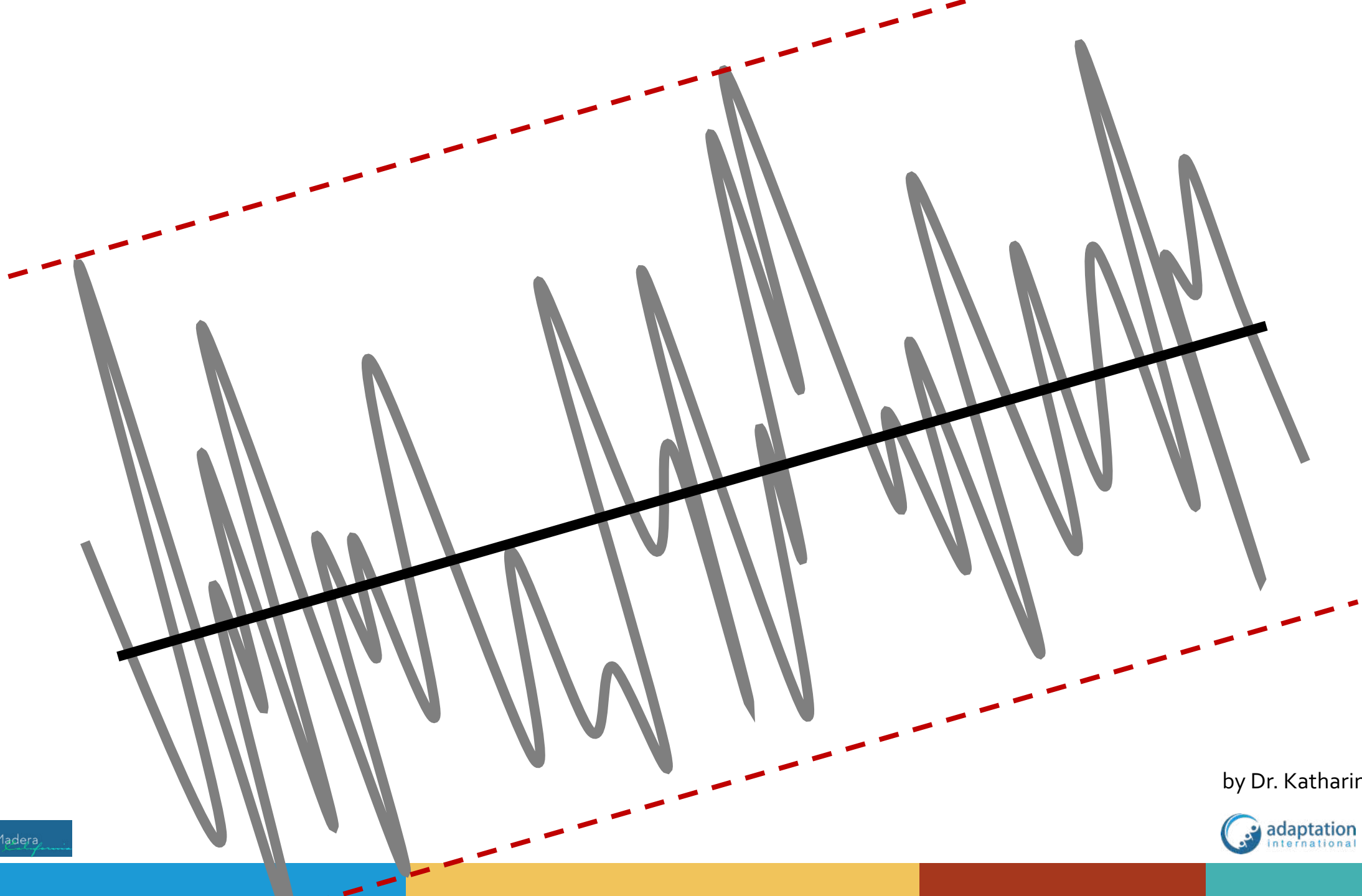
by Dr. Katharine Hayhoe



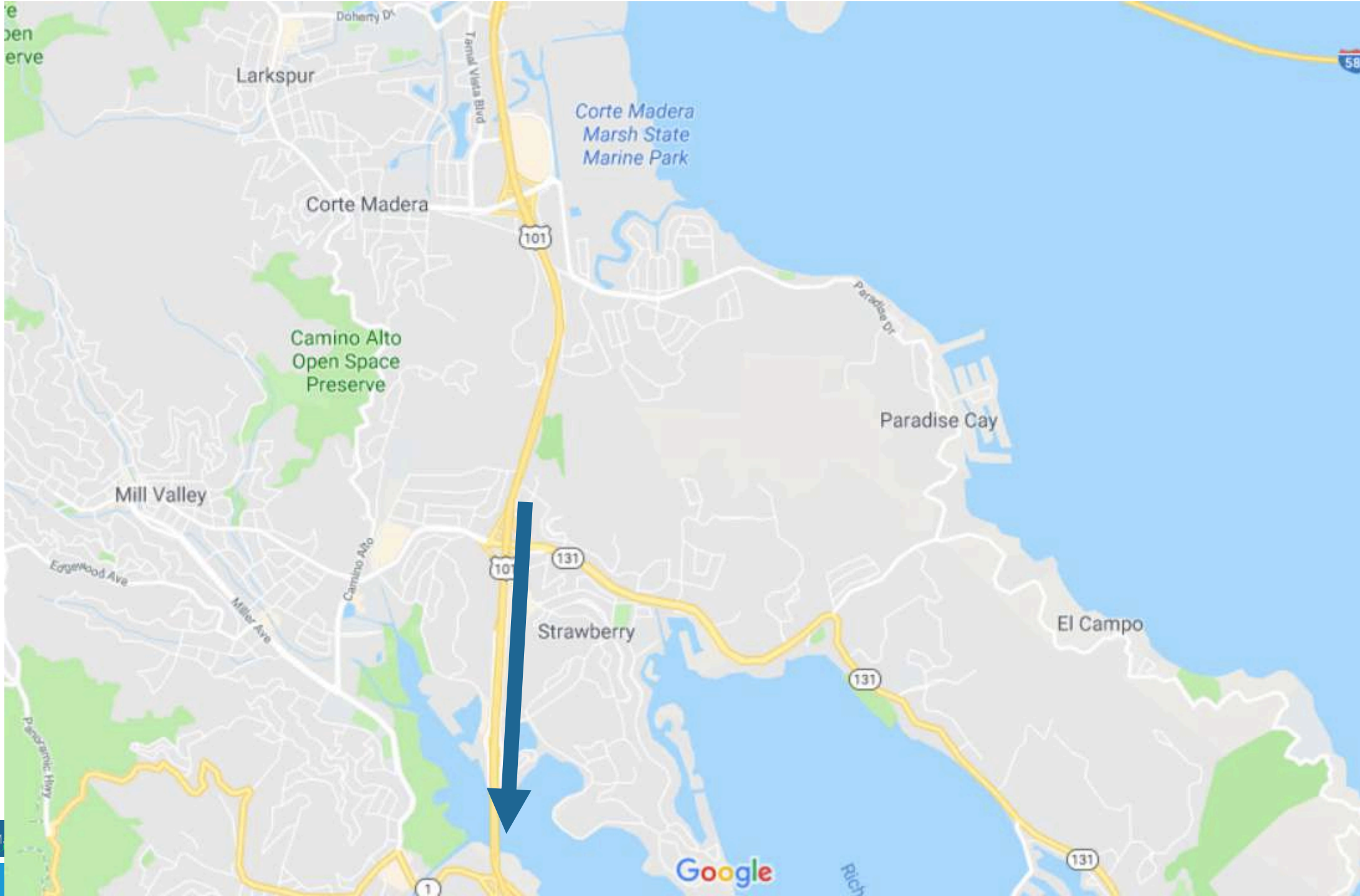
by Dr. Katharine Hayhoe



by Dr. Katharine Hayhoe



by Dr. Katharine Hayhoe



Driving using
the rear view
mirror won't
work





Values Driven and Science Based



Project Timeline

- ❖ Purpose: enhance the resilience of our community
- ❖ Scope: all sectors, Town-wide, long range
- ❖ Likely Outcomes: Framework for investment and change

2019



Laying the
Foundation



Engaging
on
Adaptation



Exploring
Adaptation
Options

2020



Refining
Adaptation
Approaches



Draft and
Finalize
Adaptation
Plan



Changing Conditions

(History as a Prelude to the Future)

Corte Madera Marsh 1926



Corte Madera Marsh 1960

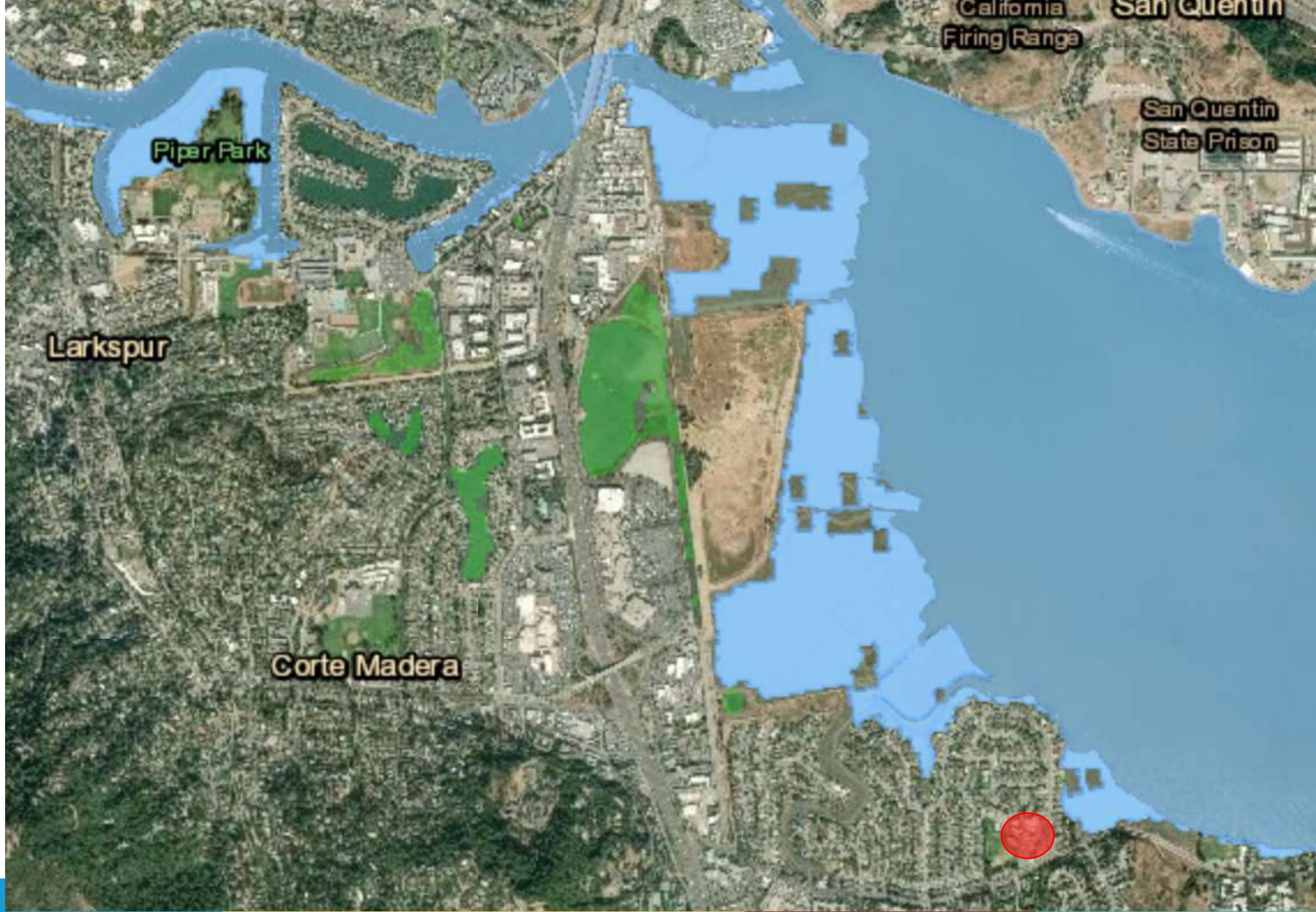




Shoreline Neighborhoods and Flooding



Current Shoreline



Current Shoreline+
100 year flood



Greenbrae

Miwok
Park
State of
California
Firing Range

San Quentin

San Quentin
State Prison

Piper Park

Larkspur

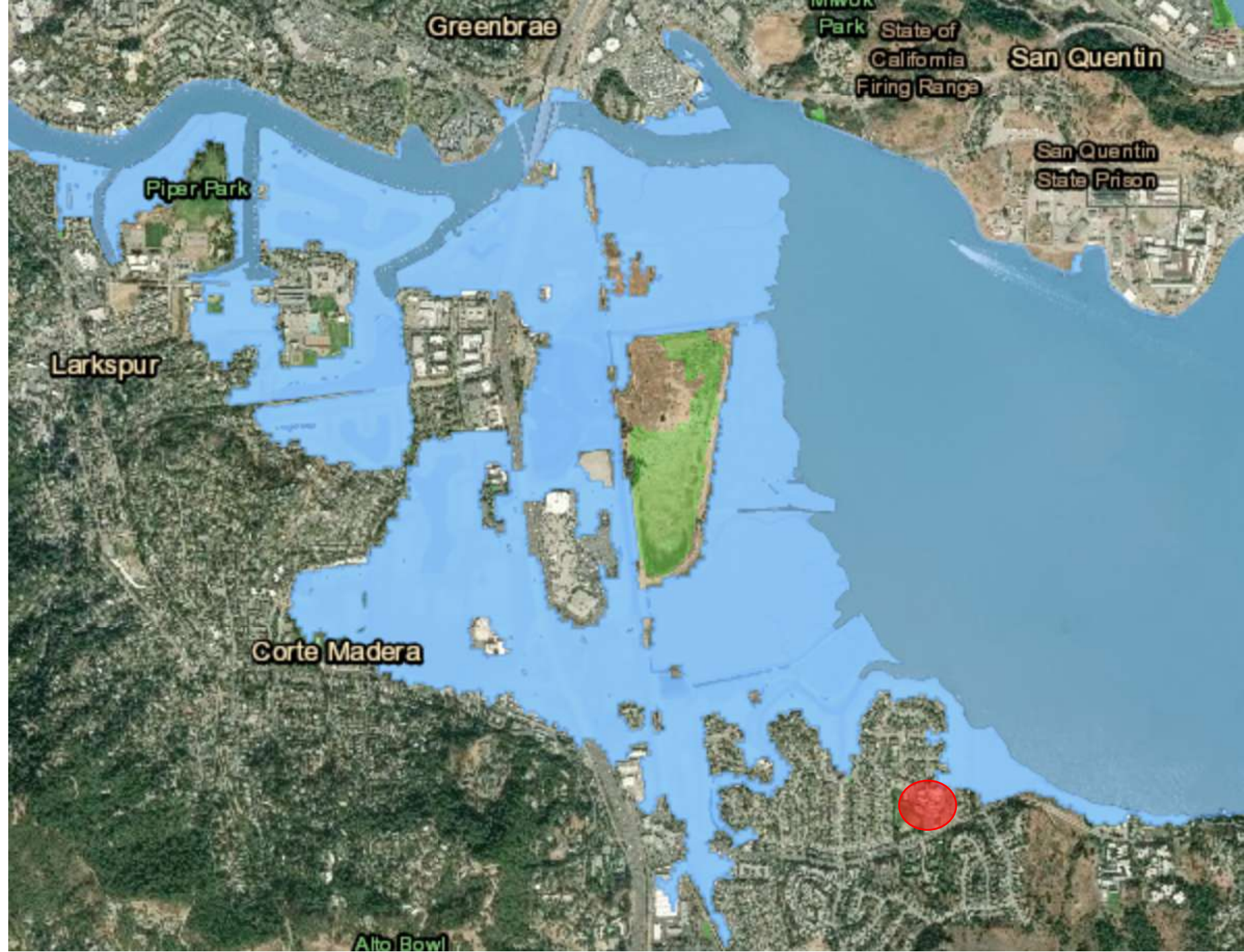
Corte Madera

Alta Bowl



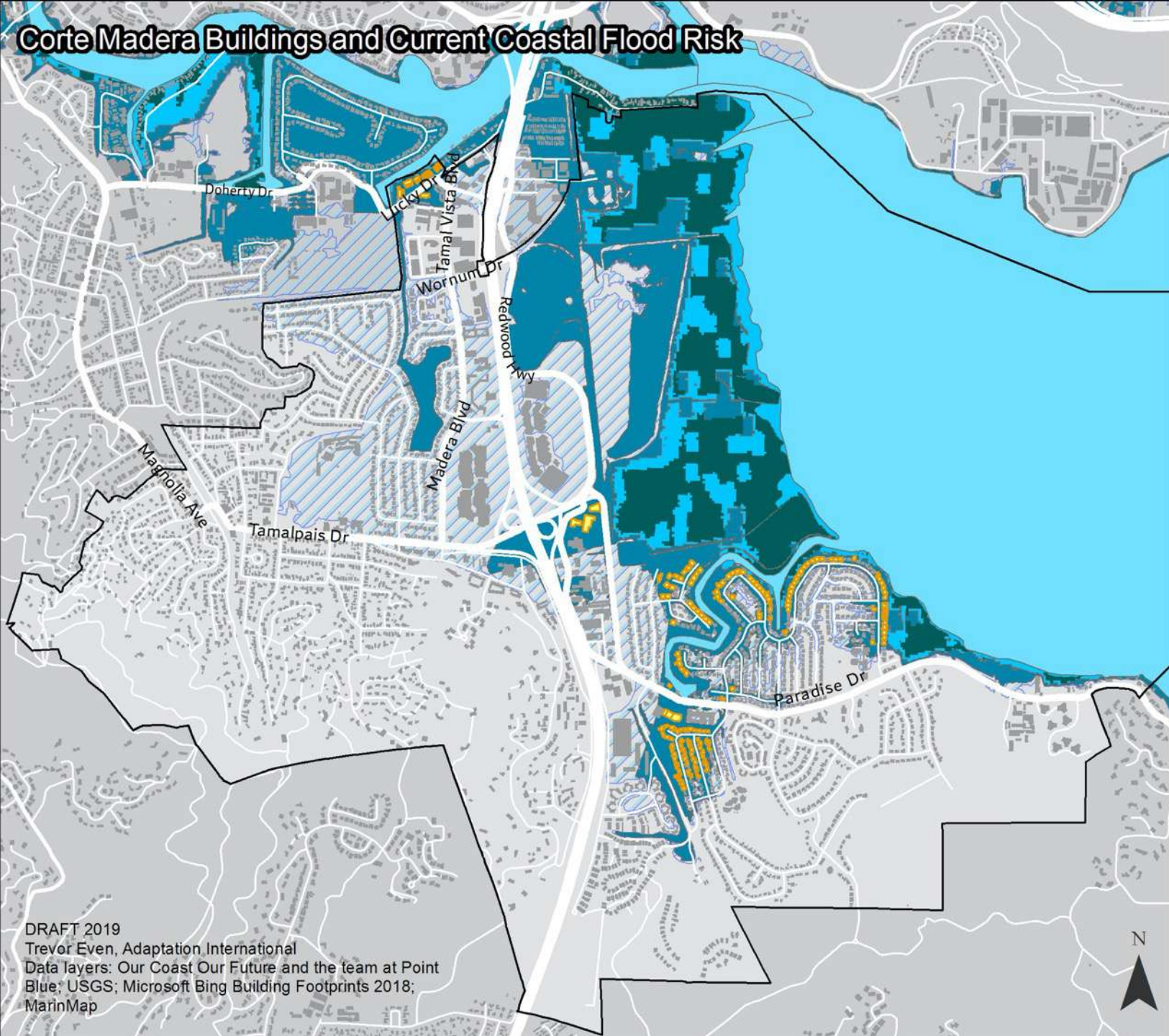
20" Sea Level Rise











20" Sea Level Rise + 100 year flood

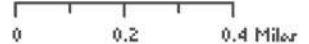
Corte Madera Buildings and Current Coastal Flood Risk



Legend

-  Buildings in Current 1% Chance/yr. Wave Event Inundation Zone (181)
-  King Tide Event - Average Inundation
-  1% Chance/yr. Wave Event - Minimum Inundation
-  1% Chance/yr. Wave Event - Maximum Inundation
- FEMA Flood Zones**
-  Coastal Flood Risk Zone (VE, 100 yr. + Waves)
-  100 yr. Flood Hazard Zone (AE, 1%)

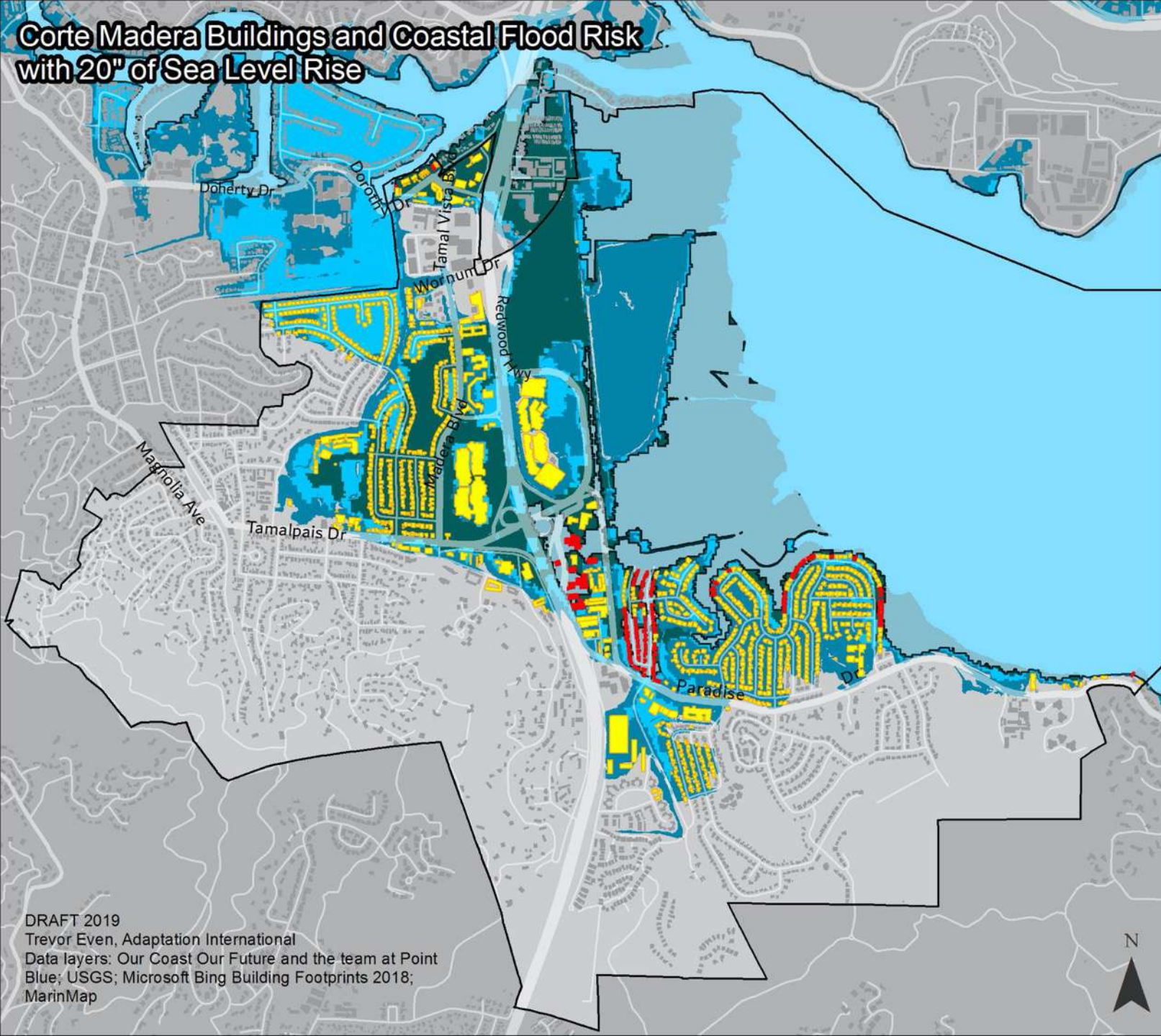
DRAFT 2019
 Trevor Even, Adaptation International
 Data layers: Our Coast Our Future and the team at Point Blue; USGS; Microsoft Bing Building Footprints 2018; MarinMap



based on OCOF Projections



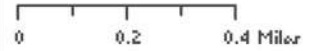
Corte Madera Buildings and Coastal Flood Risk with 20" of Sea Level Rise



Legend

- Buildings Lost (108)
- Buildings in 1% Chance/yr. Wave Event Inundation Zone at 20" SLR (1,134)
- New Shoreline at 20" SLR
- King Tide Event - Average Inundation
- 1% Chance/yr. Wave Event - Minimum Inundation at 20" SLR
- 1% Chance/yr. Wave Event - Maximum Inundation at 20" SLR

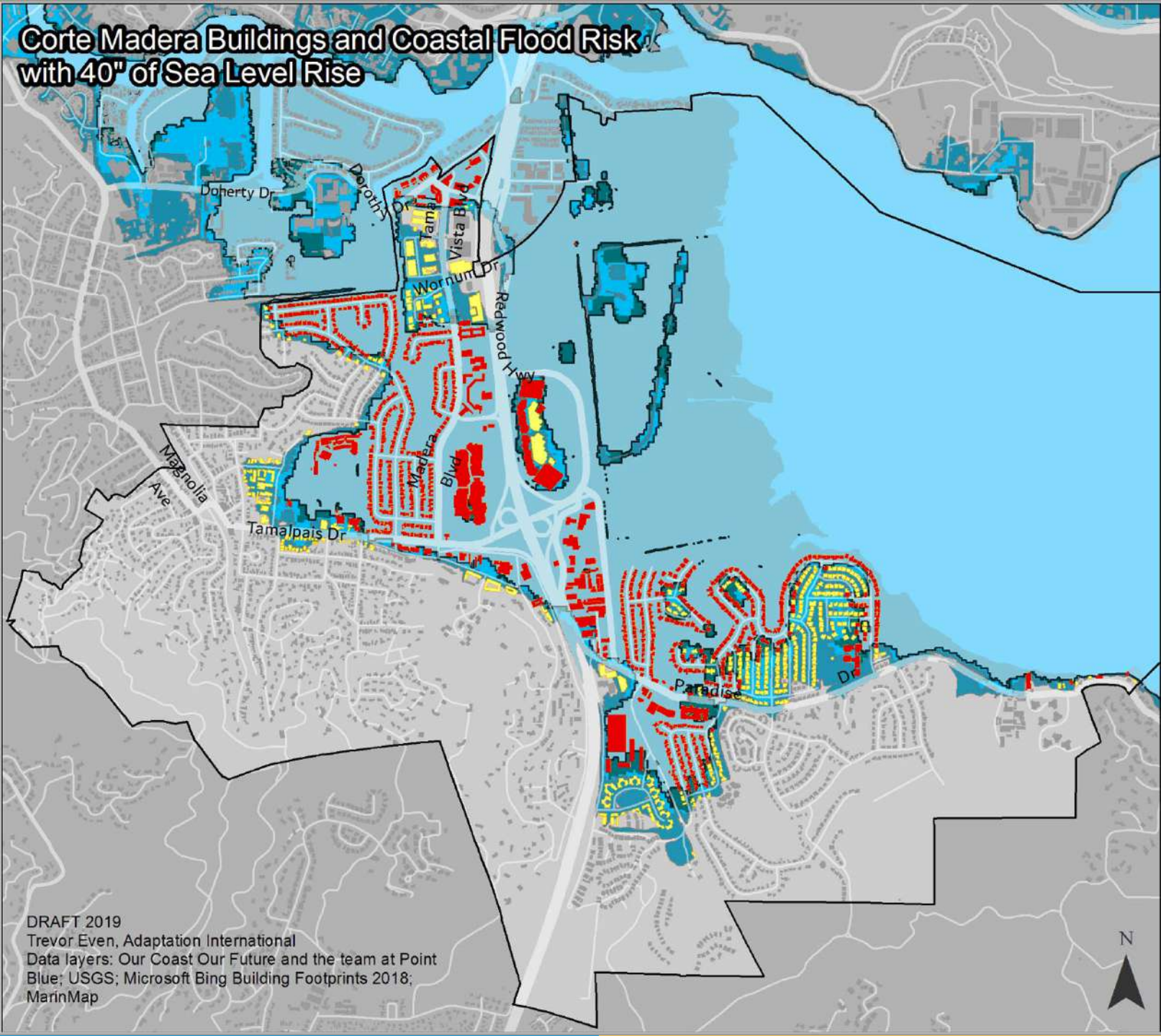
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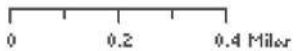
Corte Madera Buildings and Coastal Flood Risk with 40" of Sea Level Rise



Legend

- Buildings Lost at 40" SLR (898)
- Buildings in 1% Chance/yr. Wave Event Inundation Zone at 40" SLR (1,297)
- New Shoreline at 40" SLR
- King Tide Event - Average Inundation
- 1% Chance/yr. Wave Event - Minimum Inundation at 40" SLR
- 1% Chance/yr. Wave Event - Maximum Inundation at 40" SLR

DRAFT 2019
 Trevor Even, Adaptation International
 Data layers: Our Coast Our Future and the team at Point Blue; USGS; Microsoft Bing Building Footprints 2018; MarinMap



based on OCOF Projections



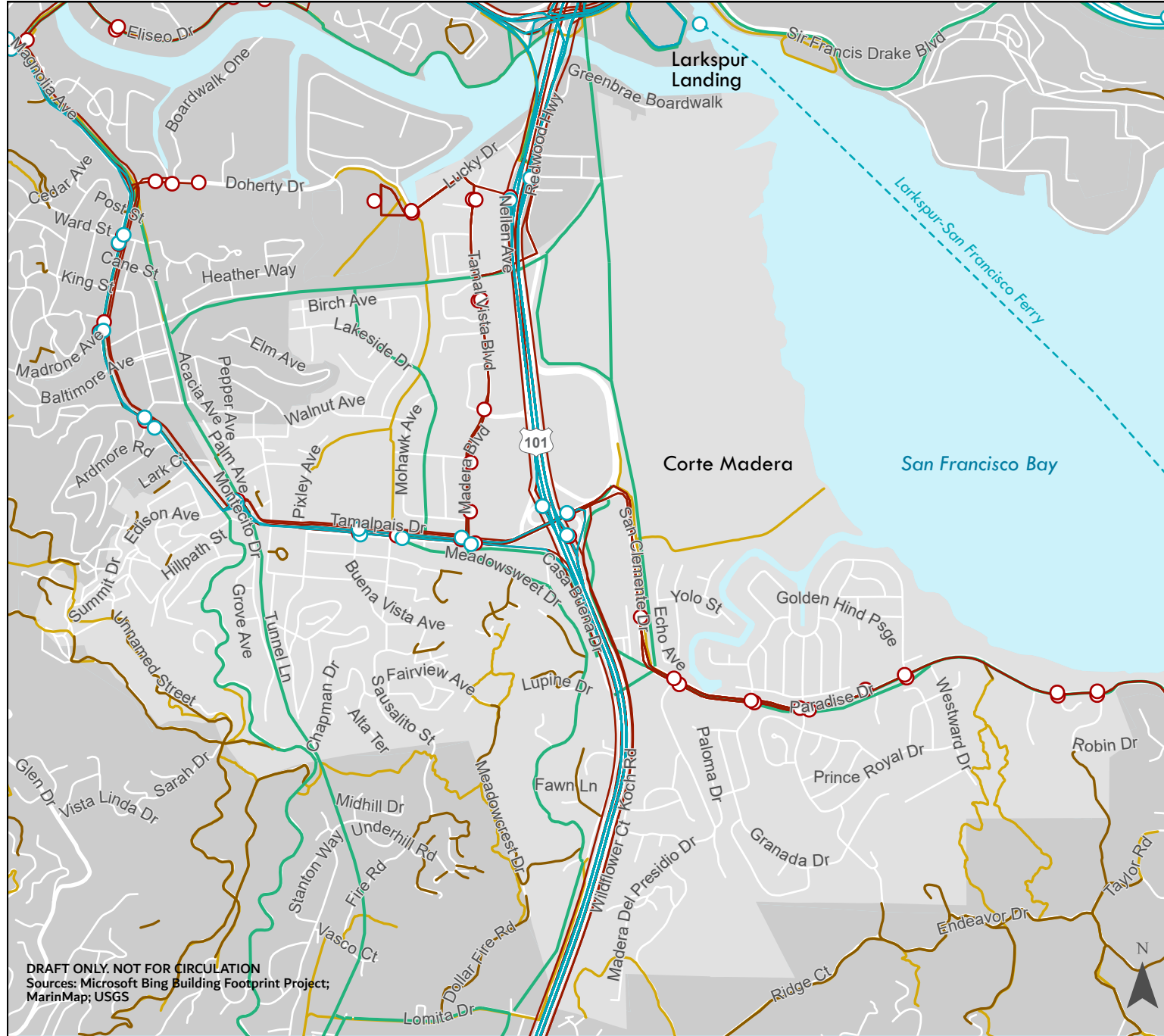
Threshold	Scenario Possibilities	
	SLR	Event Meeting Threshold
Current Conditions/Episodic Flooding (MHHW)	0"	King-tide
	0"	100-yr Storm
Levee Overtopping/Significant Episodic flooding (MHHW + 20")	0"	100-yr Storm (max potential)
	10"	King-tide
	20"	Daily Tides
Chronic and Extensive Flooding (MHHW + 40")	10"	100-yr Storm
	20"	King-tide
	40"	Daily Tides

Present-2030	2050-2100
2030-2050	2100+










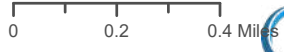
Connections



Transportation

-  Golden Gate Transit
-  Marin Transit
-  Bikeways
-  Fireroads
-  Mixed Use Trails

DRAFT ONLY. NOT FOR CIRCULATION
 Sources: Microsoft Bing Building Footprint Project;
 MarinMap; USGS





Discussion

Resilience Advisory Committee Discussion

- **What opportunities does the Town have now to increase preparedness/resilience? How do those change in the next 10-20 years? (or in the Long-term?)**
- **Tips on Approaching the Managed Retreat Conversation?**
- **Critical Infrastructure – what should be included?**
- **Opportunities for “mainstreaming” and co-benefits?**



Ways to Stay Involved

Ways to Stay Involved

- Spread the word
- Invite your neighbor/friend/colleague to participate
- Add your input to the community survey
- www.cortemaderaadapts.org



THANK YOU!

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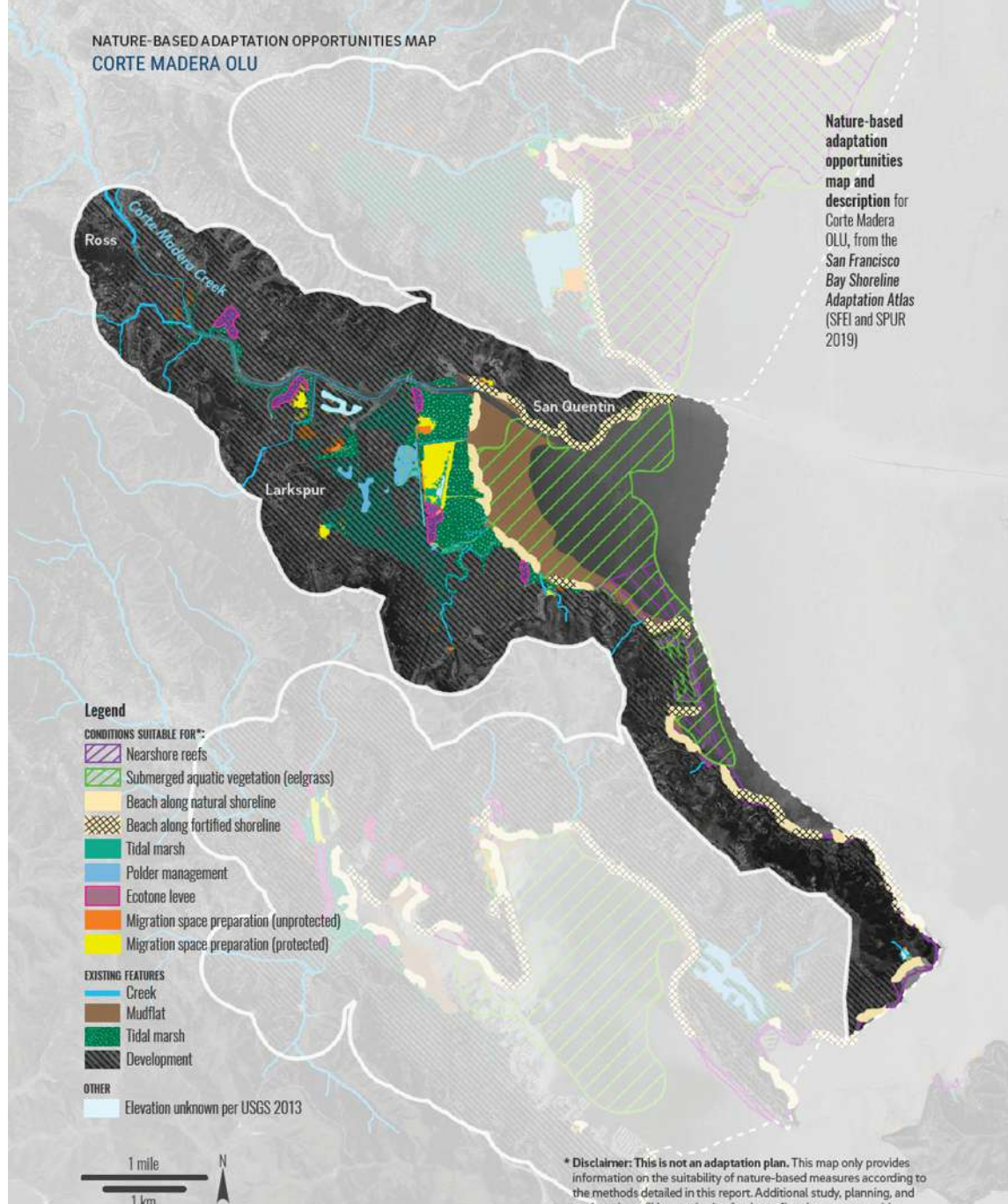




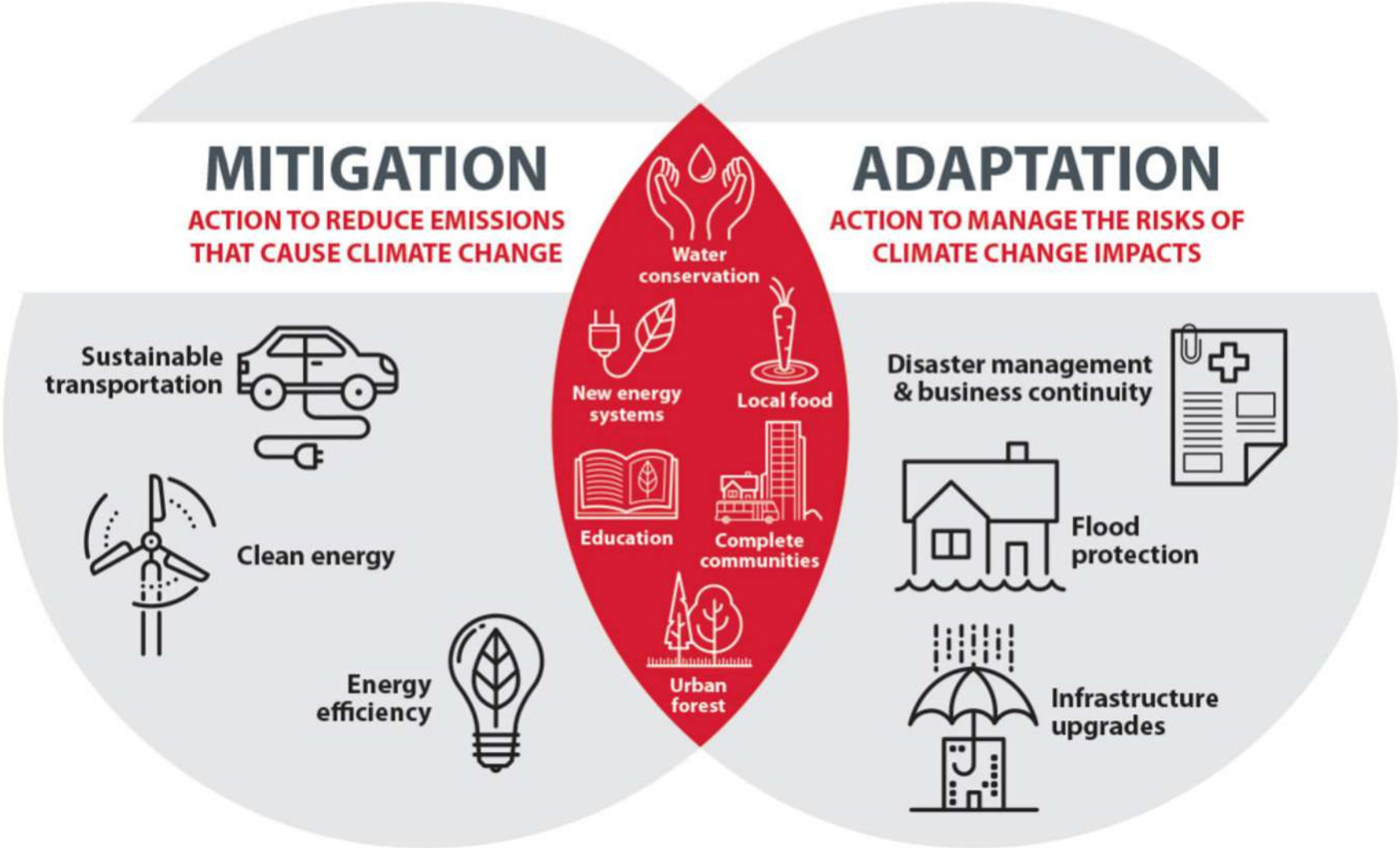
Support slides

NATURE-BASED ADAPTATION OPPORTUNITIES MAP
CORTE MADERA OLU

Nature-based adaptation opportunities map and description for Corte Madera OLU, from the San Francisco Bay Shoreline Adaptation Atlas (SFEI and SPUR 2019)



Building Climate Resilience



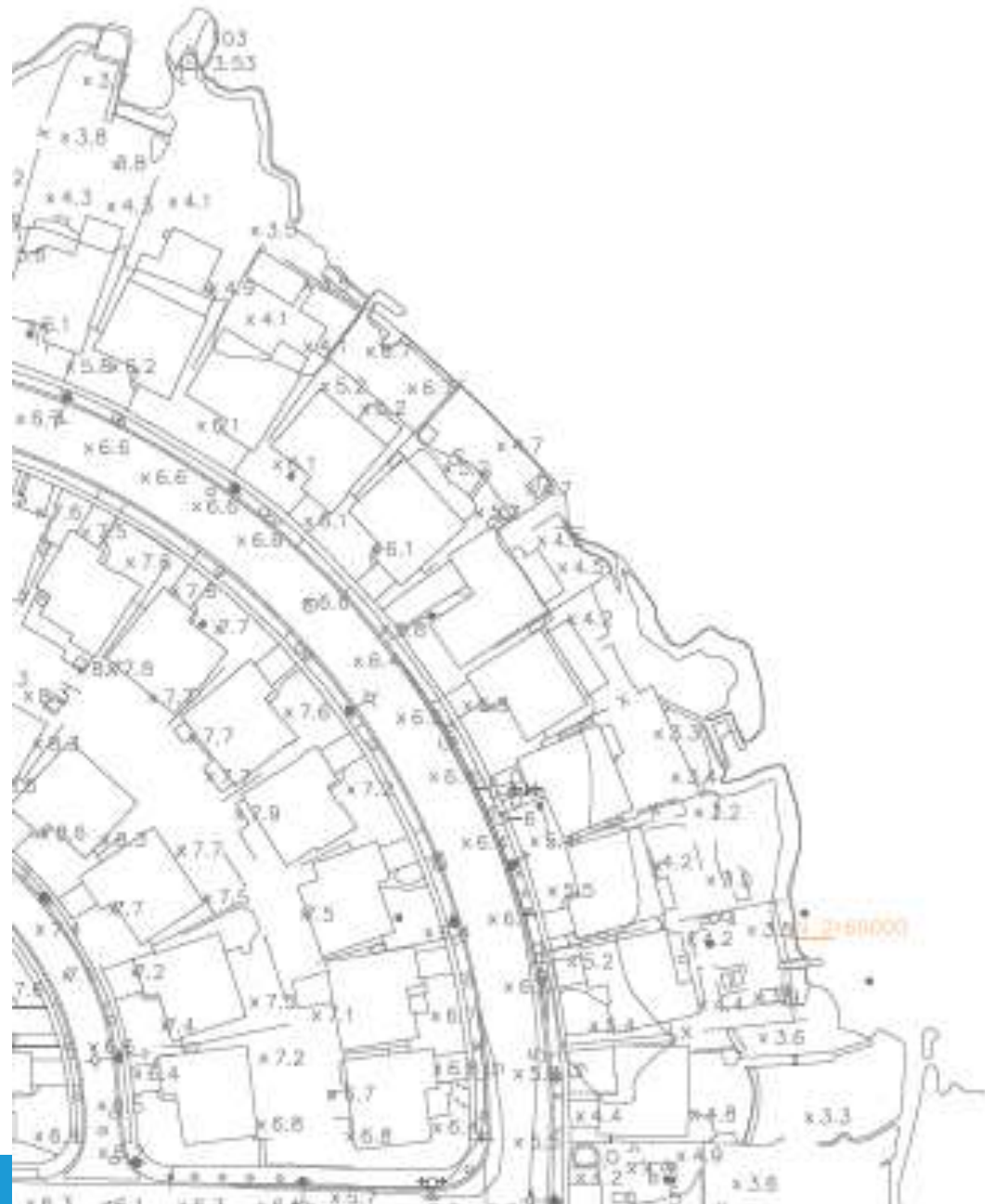
Adaptation Planning Effort

Climate Adaptation Plan

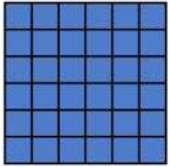
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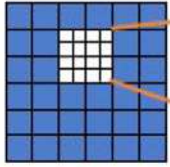




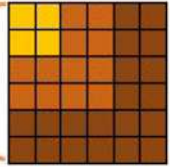
Regional Climate Models



Global climate models (GCMs) divide the **Earth** into a series of grid boxes.



Regional climate models (RCMs) divide **part of the Earth**, like the Great Lakes Region, into a series of smaller grid boxes.



A prediction, such as future temperature, is made by the RCM for the smaller region of interest by using the GCM prediction at the boundary as a starting point.



Images of the prediction (maps) may be smoothed versions of that output.

“Essentially every model is wrong, Some are useful.” – George Box



Hal
Brown
Park

Greenbrae

Miwok
Park
State of
California
Firing Range

San Quentin

San Quentin
State Prison

Piper Park

Larkspur

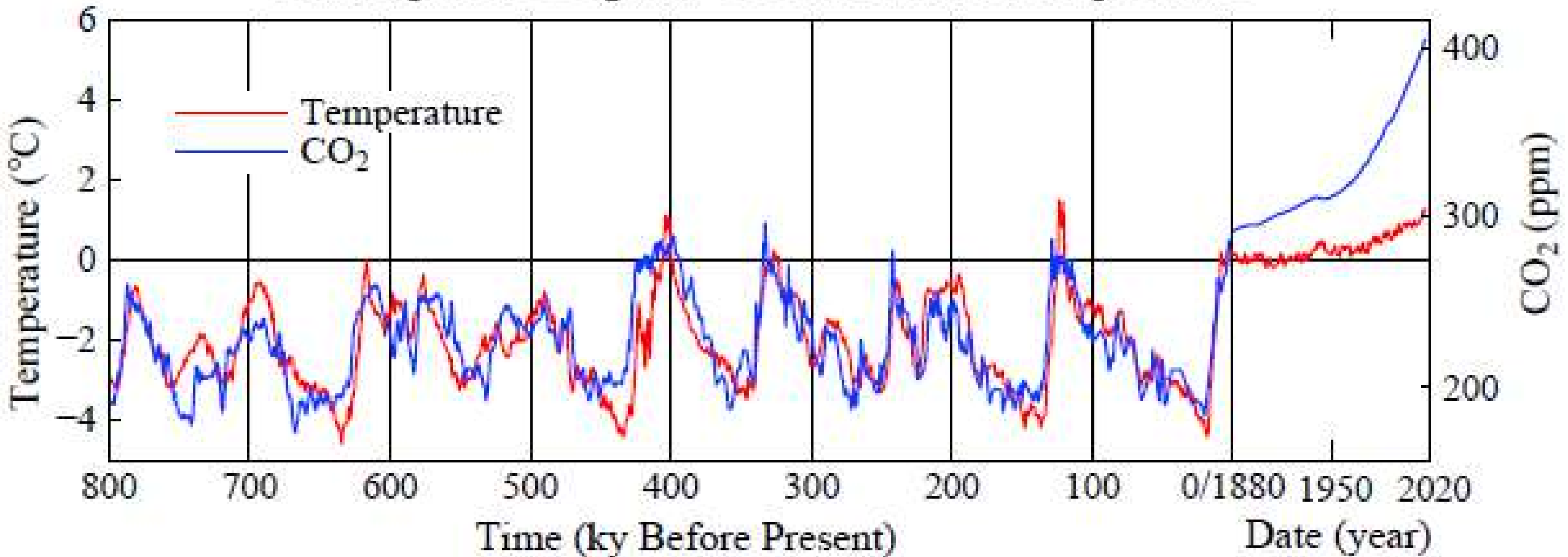
Corte Madera

20" Sea Level Rise king tide

Climate Change Facts

What are the measurements on Greenhouse Gases and Temperatures?

Atmospheric CO₂ and Global Surface Temperature



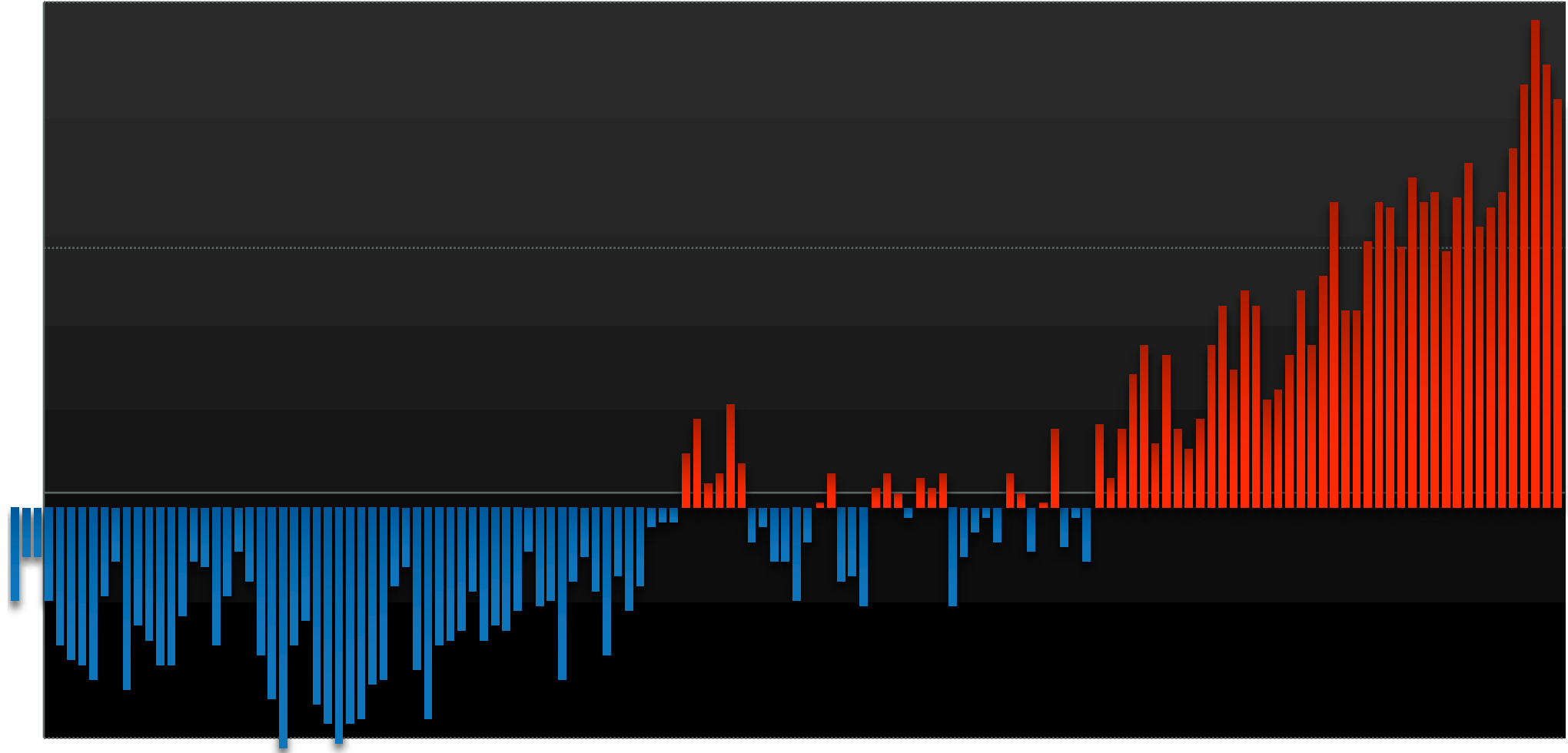
CO² at Highest Level in >800,000 yrs



<https://climate.nasa.gov/evidence/>

Global Surface Temperature – Departure from Average

1880 – 2018



Global Ocean Heat Content

Percent Change Since 1920

- Surface to -700 m
- 700 to -2,000 m
- 2,000 m and deeper

Half of the increase
has occurred since 1997

1920

1940

1960

1980

2000

2016