OneShoreline
Building Solutions for a Changing Climate

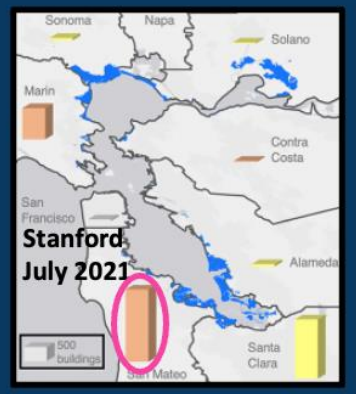
Guidance for Resilient Public Infrastructure

Presentation to the BACWA Collections Systems Committee

February 5, 2026

Summer Bundy
Director of Projects

OneShoreline Background



Climate change is a transformative challenge most effectively addressed through regional collaboration.

State legislation established OneShoreline on January 1, 2020 as the first independent government agency to plan and build regional resilience to the water-related impacts of climate change: flooding, sea level rise and groundwater rise, coastal erosion, and drought.

A holistic approach to:

THREATS

GEOGRAPHY

OBJECTIVES

2025-26 Priorities

POLICY GUIDANCE

Plan land use, private development, and public infrastructure for **climate-driven conditions and with regional resilience** projects; and develop Shoreline Adaptation Plans complying with new State guidelines

PROJECTS

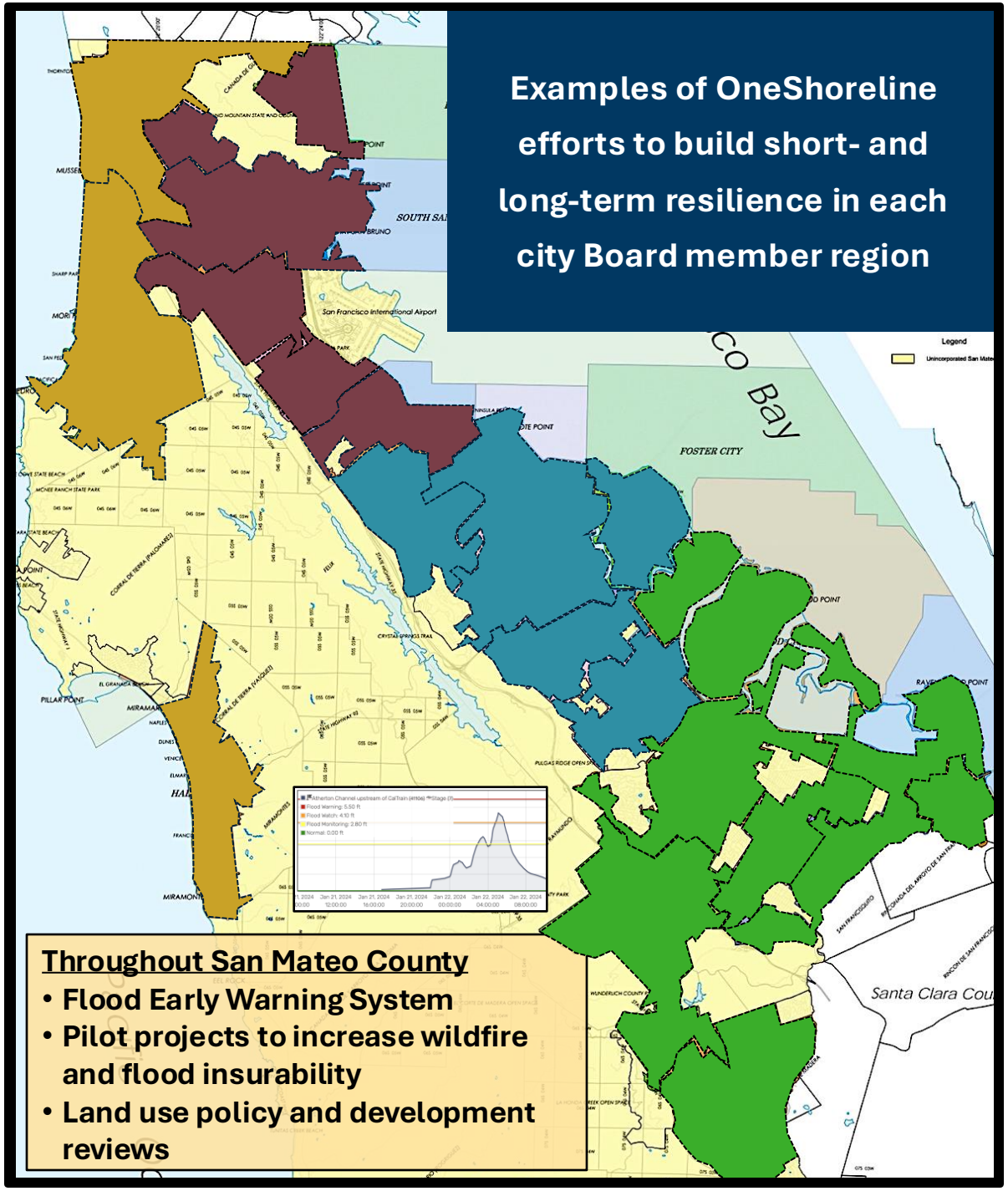
Advance **projects that align long-term resilience** for developed, natural, and recreational areas across jurisdictions; and **economic resilience for property owners and renters**

FLOOD EARLY WARNING

Alert people to and **reduce the impacts of today's extreme storms** made worse by rising tides

FUNDING

Develop **ongoing local funding streams** to sustain these efforts long-term and to continue to leverage outside funding opportunities



Northern Bayside Region

- Brisbane Resilience Plan and Living Shoreline Project
- Colma and San Bruno Creeks (and shoreline in between)
- Millbrae & Burlingame Shoreline Resilience Project

Central Bayside Region

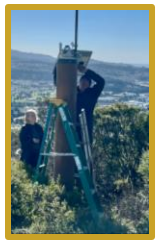
- 5-year permit to remove debris from flood prone creeks
- Mid-Peninsula Hills Satellite Water Recycling Facility
- Shoreline resilience plans connected to Southern cities

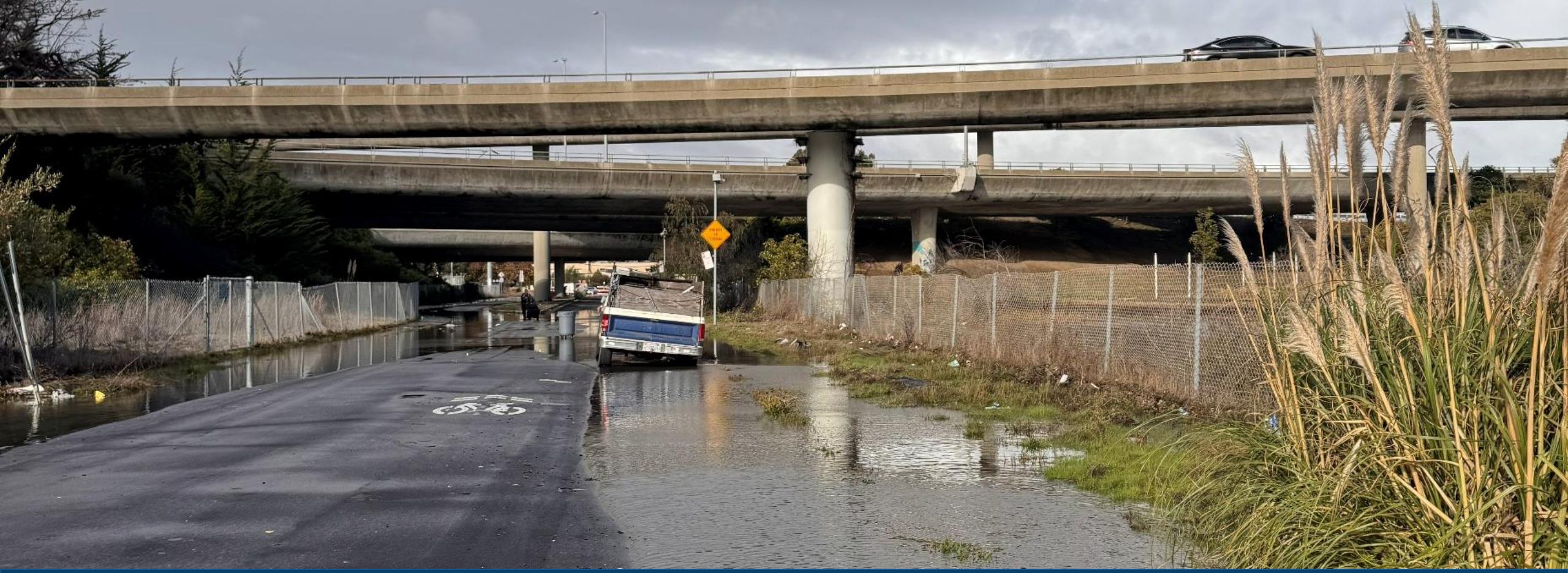
Southern Bayside Region

- Resilience plans connected to Central cities
- Bayfront Canal & Atherton Channel area
- Mobile home flooding
- Redwood Shores
- San Francisquito Creek

Coastal Region

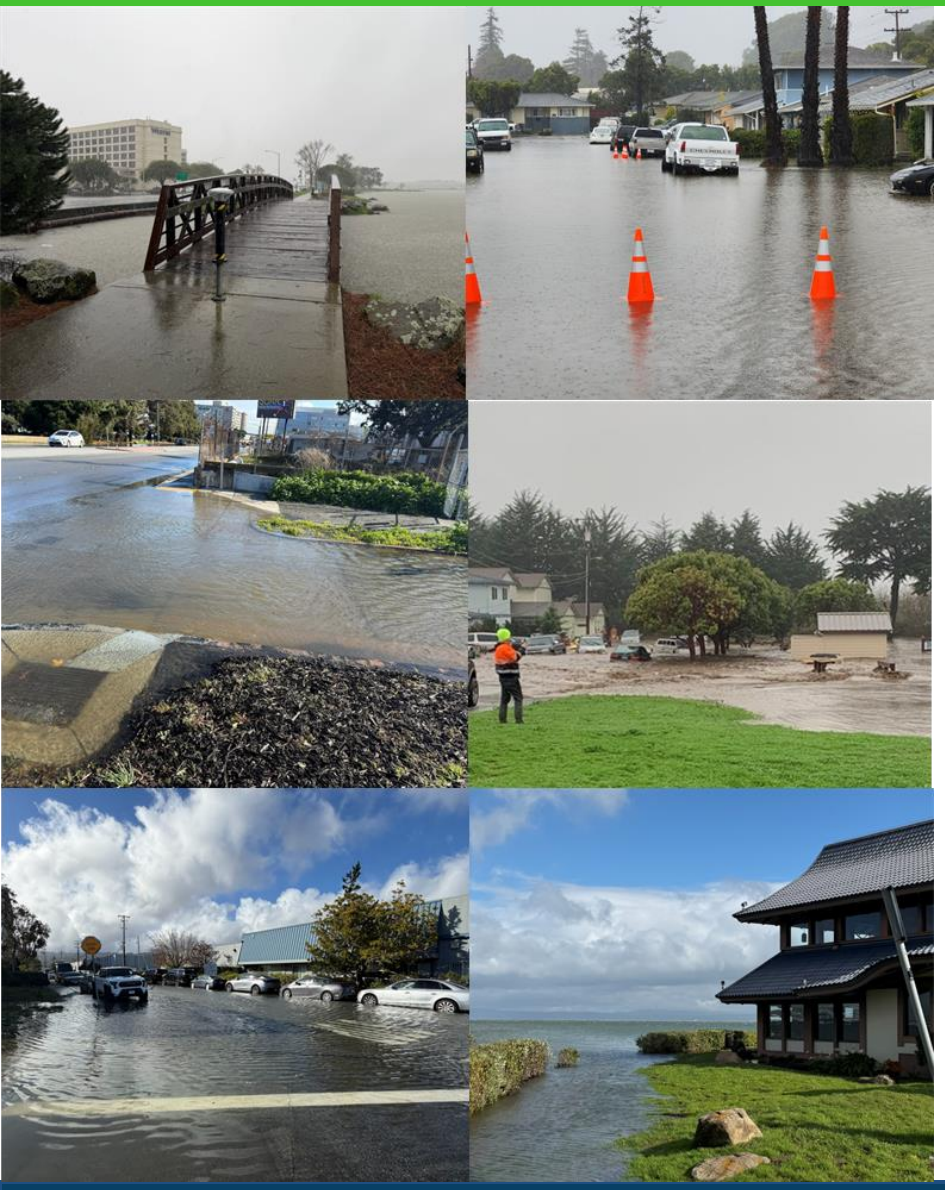
- SAM Wastewater Treatment Plant
- Expand Flood Early Warning System
- Erosion & pollution impacting beaches & landfills

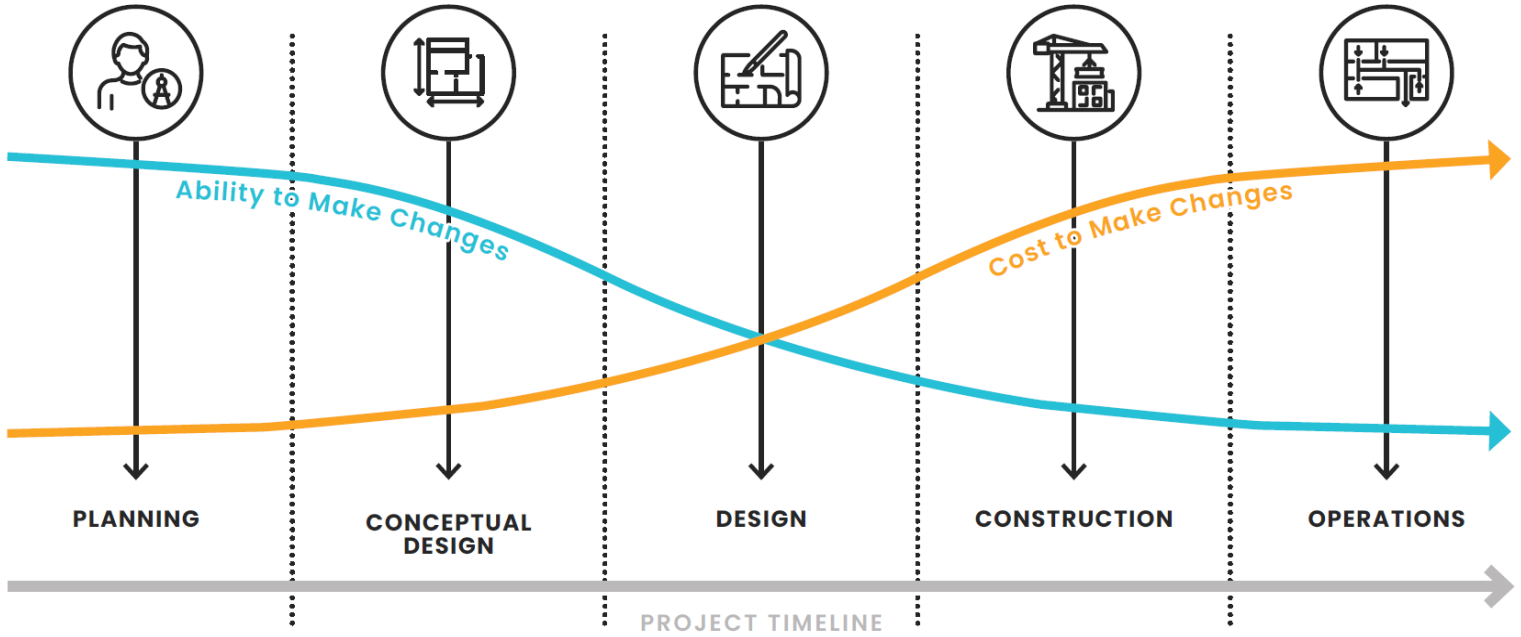




Guidance for Resilient Public Infrastructure

Drivers for Resilient Public Infrastructure Guidance





Earlier is better: Climate-informed planning and design reduces costs and improves community resilience.

What is the Resilient Public Infrastructure Guidance?

A standardized, evolving resource for jurisdictions to account for climate-driven future conditions in public infrastructure projects.

Intended to be a resource for individuals and organizations that follow adaptation planning and to serve as a model for other jurisdictions with similar challenges.

What it is	What it isn't
Voluntary guidance	Mandatory regulations
Actionable template	A reference document only
Focused on public infrastructure	Focused on private development
Evolving	Static

FY25-26: Stormwater, roads, wastewater/recycled water

FY26-27: Parks and open spaces, marinas, utilities

Our goals in developing the guidance

Integrate Climate Change

Incorporate climate hazards into capital project planning and design.

Develop San Mateo–Specific Climate Science

Update precipitation data and IDF curves to inform local design standards.

Develop Practical Infrastructure Guidance

Provide both general and asset-specific recommendations.

Incorporate Non-Structural Adaptation

Integrate policy, planning, and management strategies alongside engineered solutions.

Provide Template Language

Develop template language for drainage design manuals and long-term planning documents.

Ensure Alignment with Policy & Science

Reflect best available science, State policy guidance, and local priorities.

Advisory Committee

North

Brisbane
Burlingame
Millbrae
San Bruno
South San Francisco

Central

Belmont
Foster City
San Mateo

South

East Palo Alto
Menlo Park
Redwood City
Silicon Valley Clean Water

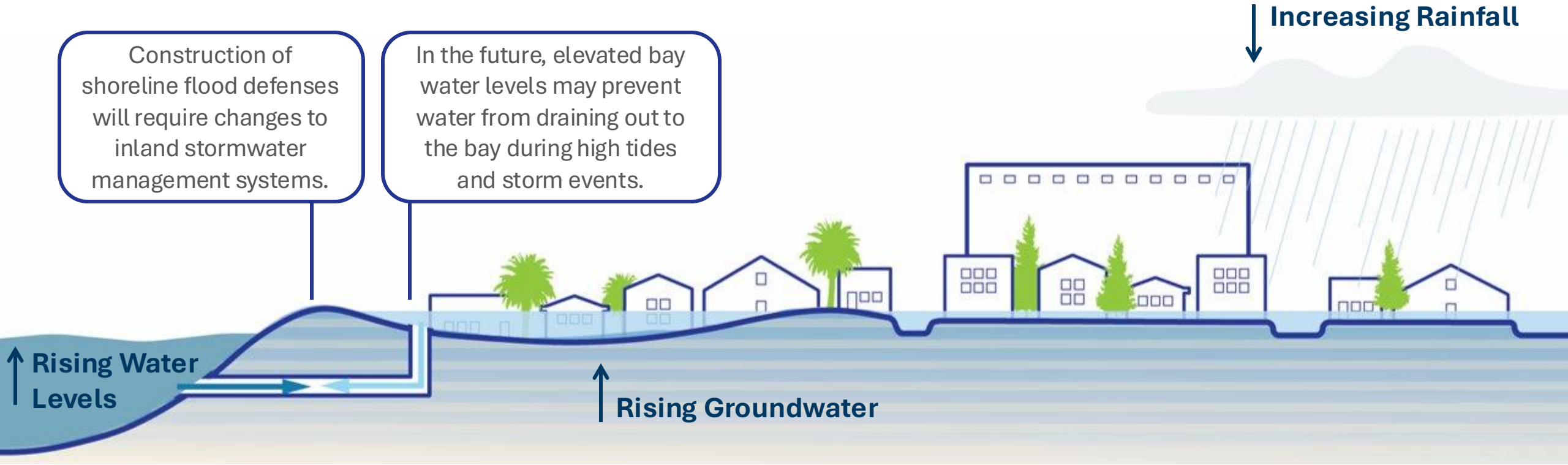
Coastal

Half Moon Bay
Resource Conservation District

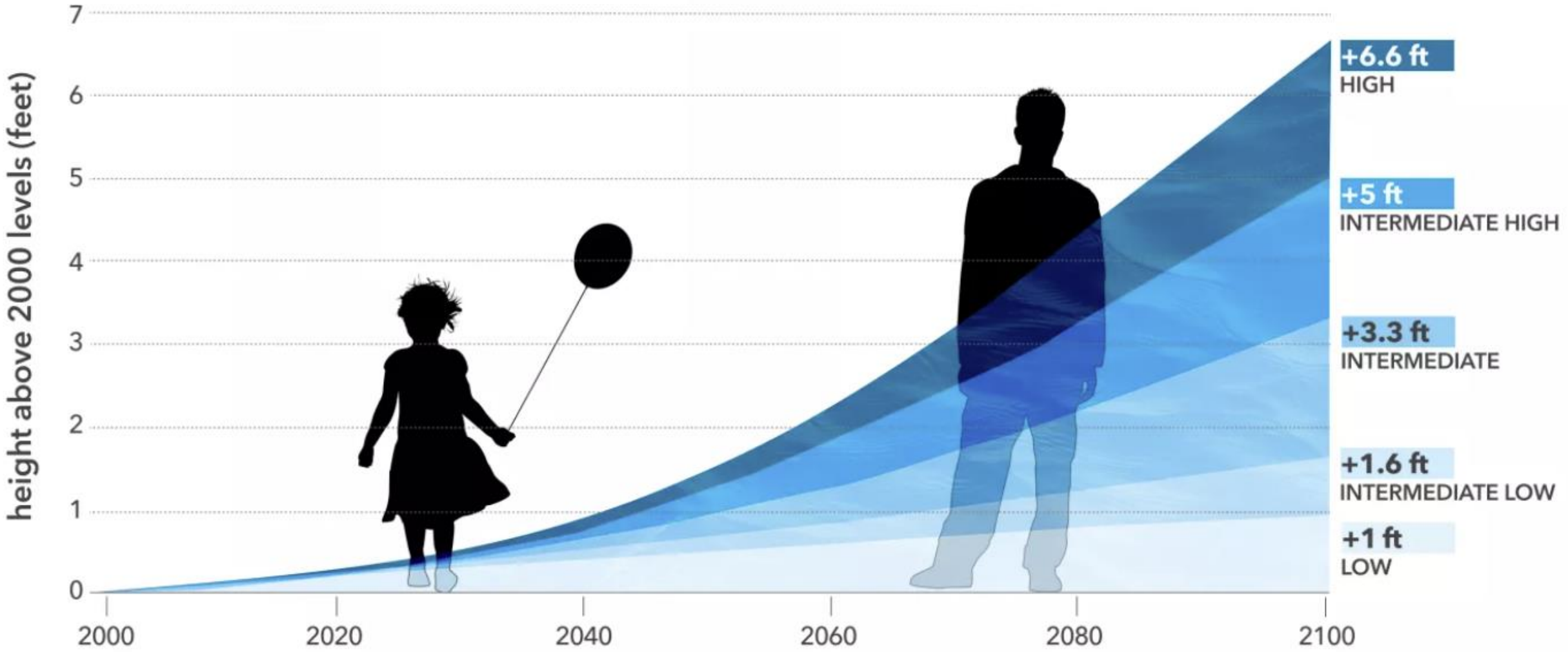
Countywide

County Planning Dept.
County Public Works Dept.
County Sustainability Dept.
Countywide Water Pollution Prevention Program
Caltrans
BACWA

Rising temperatures impact the entire water cycle



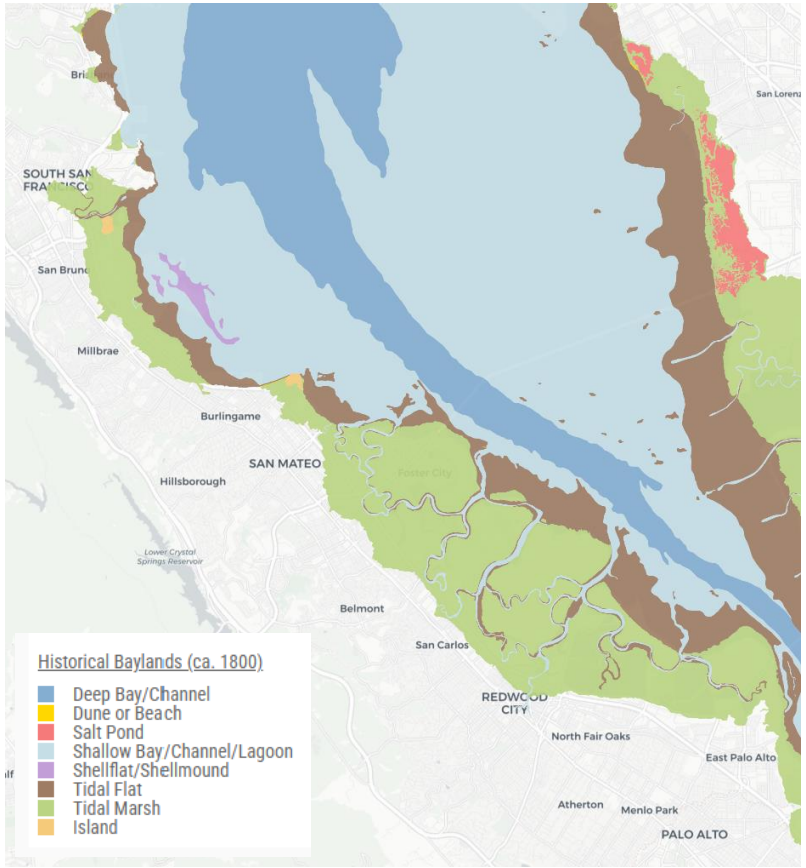
Projected Global Sea Level Rise to the Year 2100



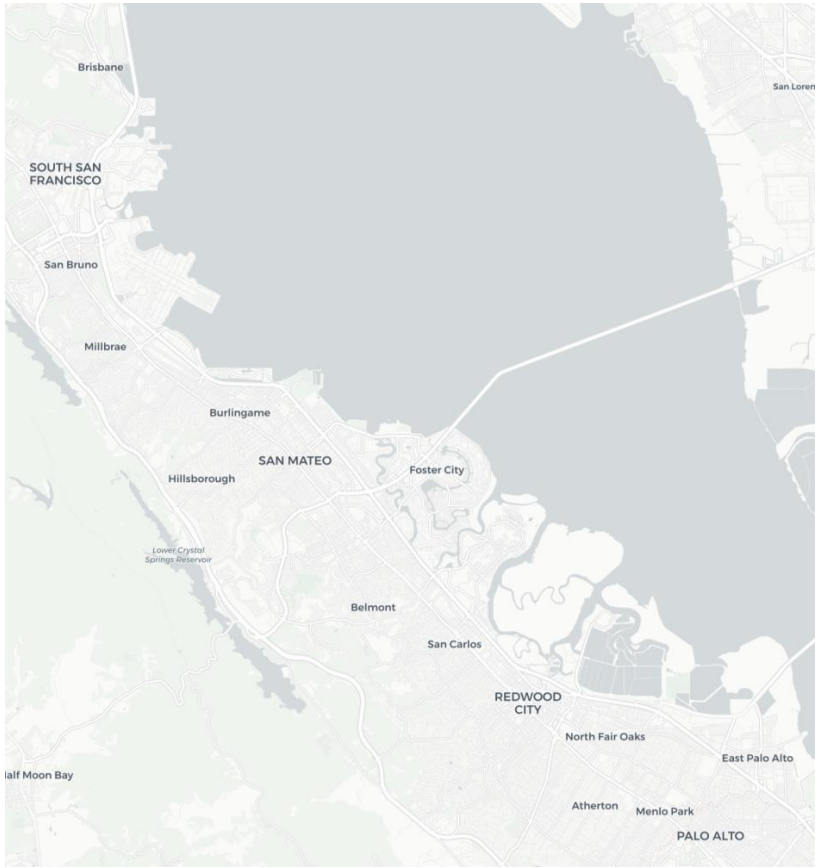
Source: climate.gov

Historical Baylands and Future Sea Level Rise

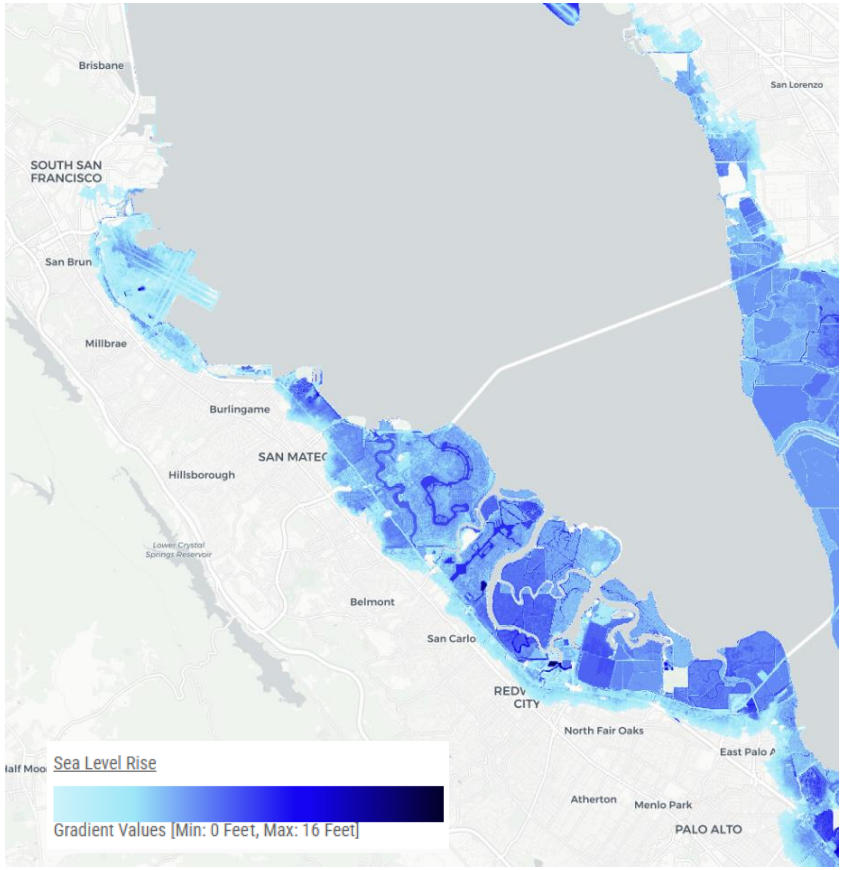
Historical Baylands



Current Bay Shoreline

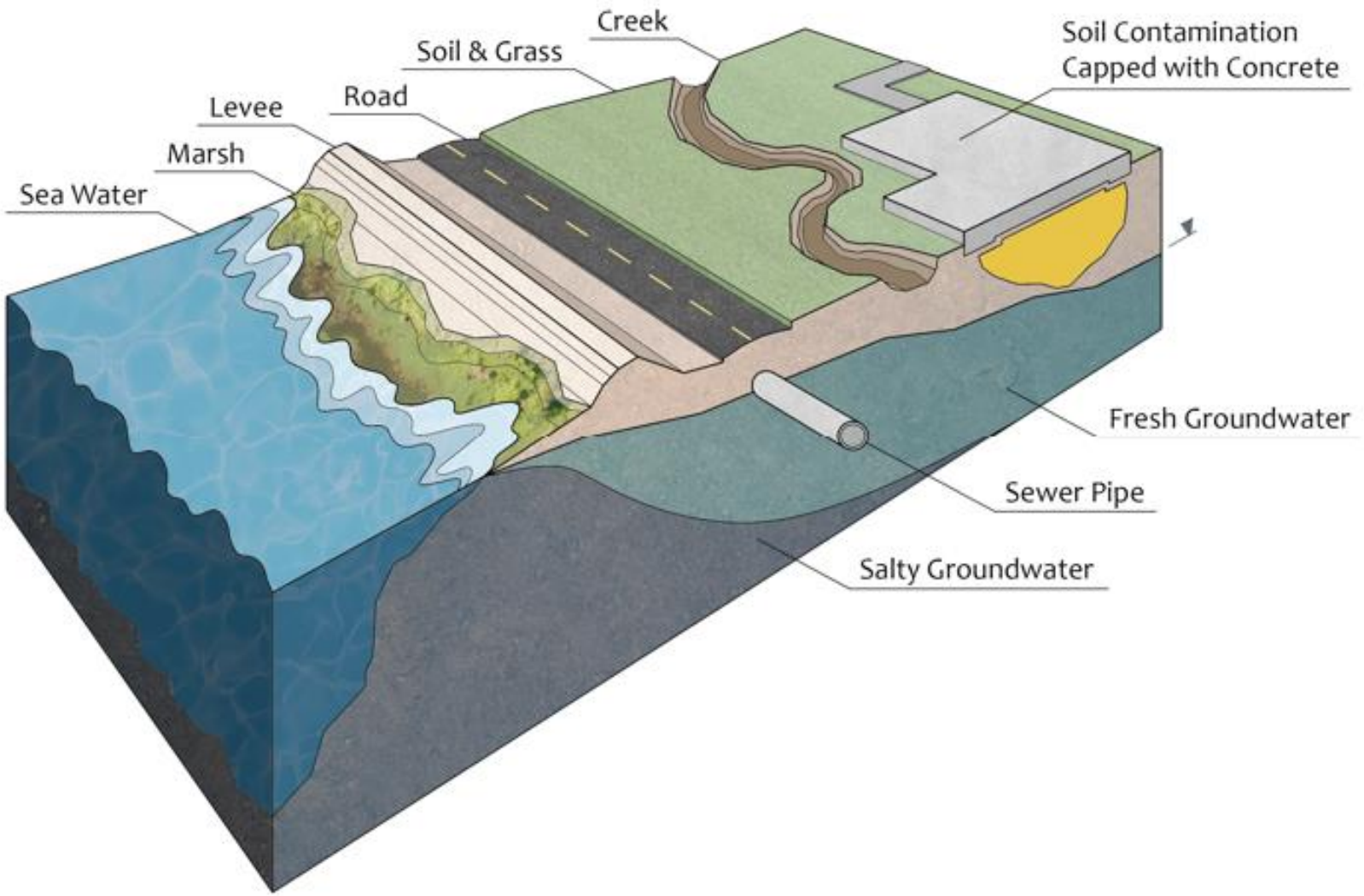


Sea Level Rise (6.6 ft)



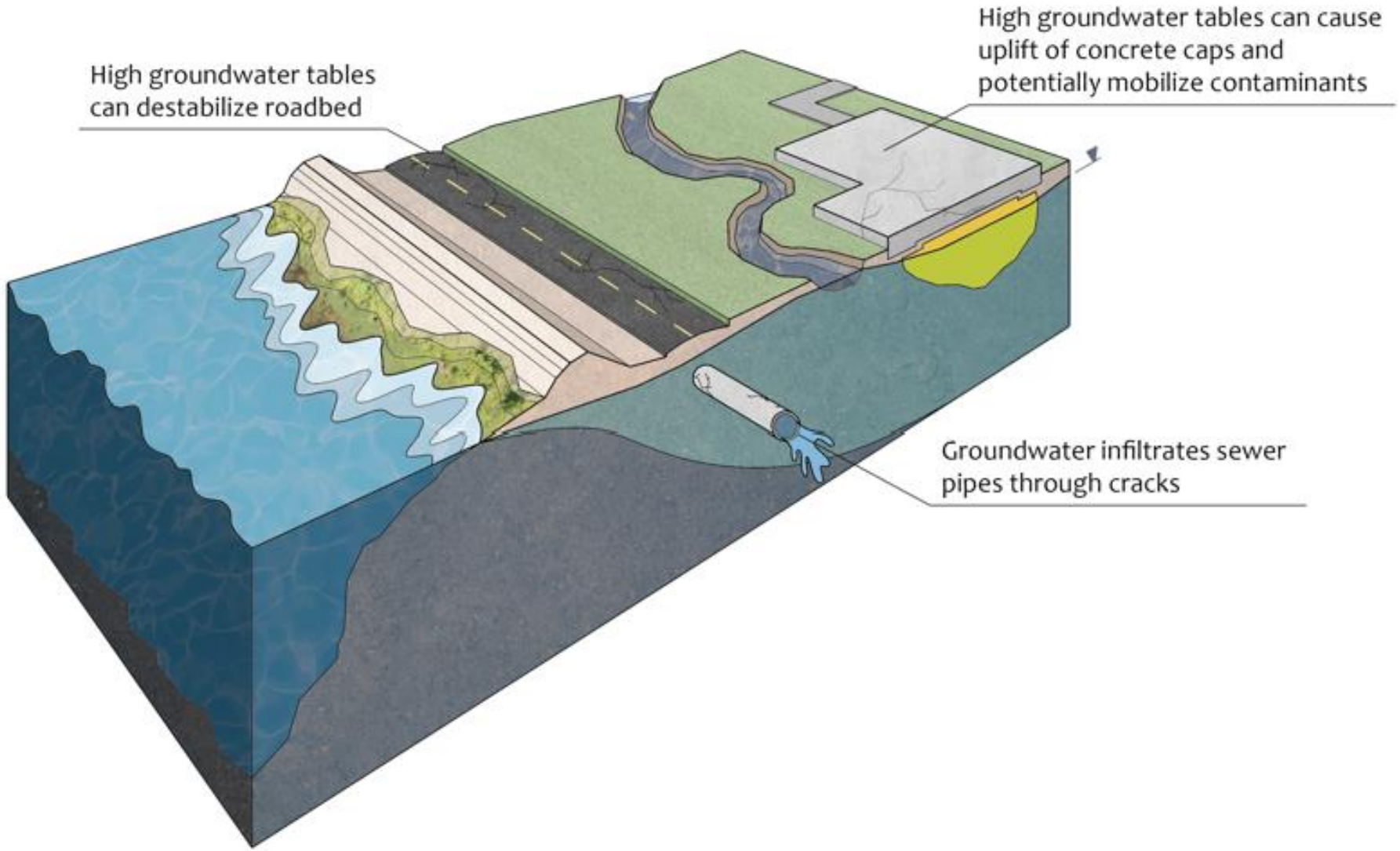
https://resilienceatlas.sfei.org/

Sea Level Rise is also Increasing Groundwater Tables



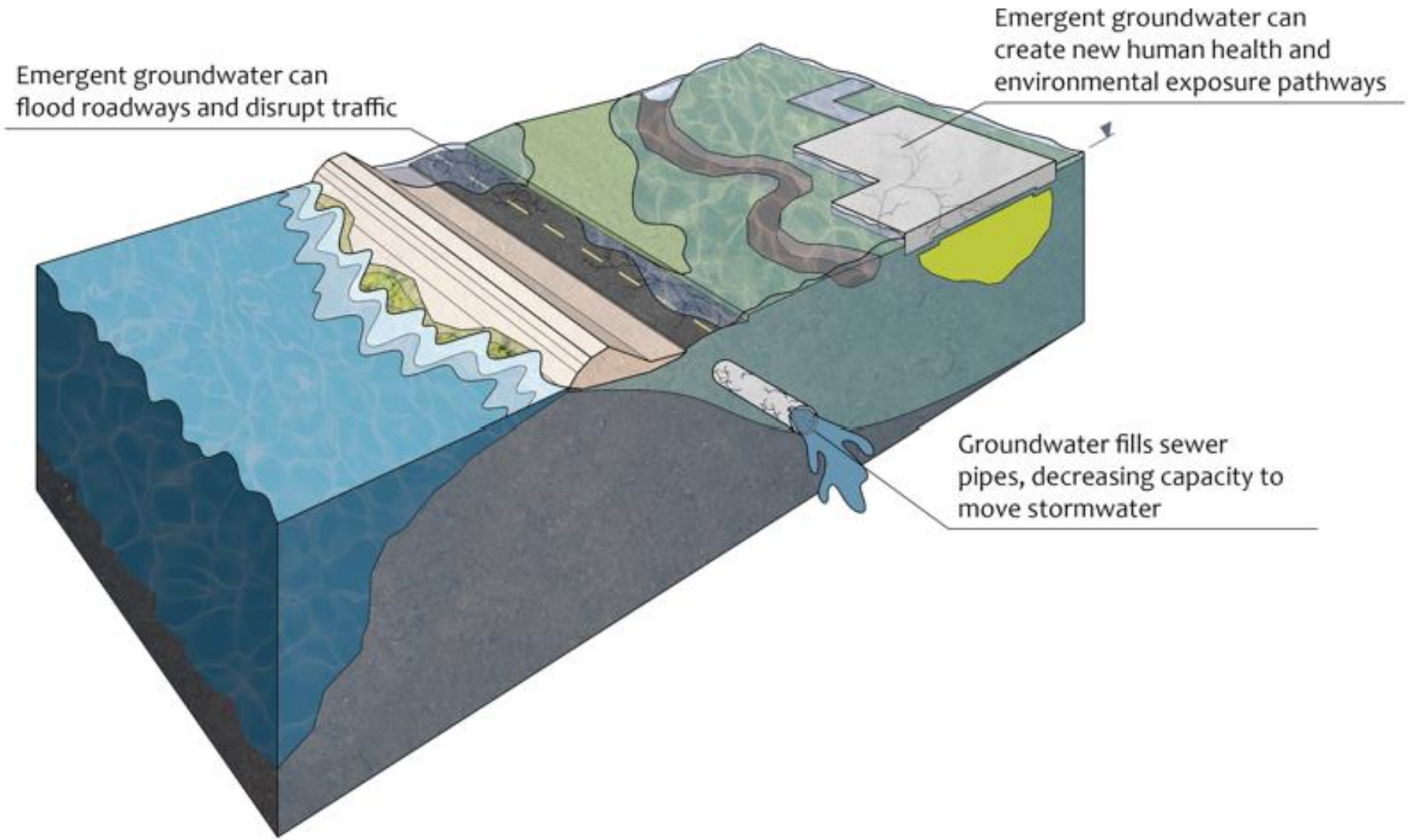
Sea Level Rise is also Increasing Groundwater Tables

As sea levels rise, it pushes the fresher shallow groundwater table up



Sea Level Rise is also Increasing Groundwater Tables

With sufficient sea level rise, the groundwater table can rise above the ground surface causing permanent ponding



The intensity of rainfall events is increasing

Study Findings

San Francisco Bay Area Domain SSP5-8.5

More Rainfall

Longer Duration

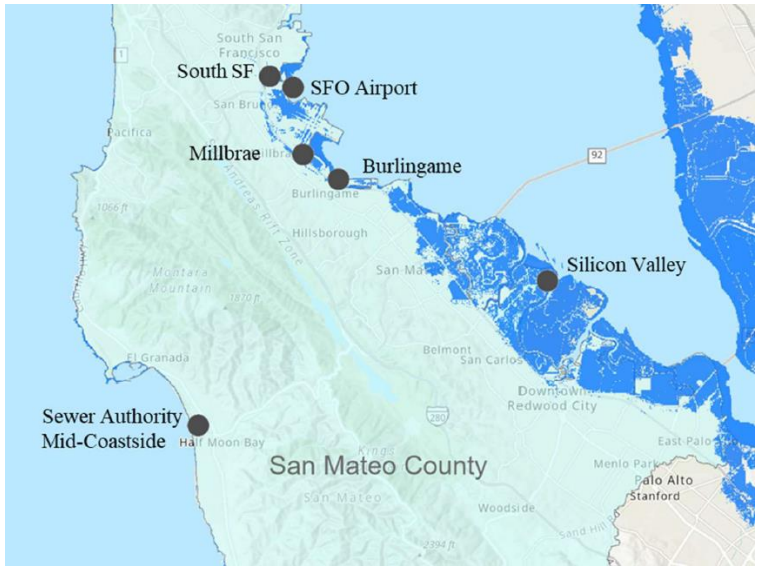
Increase in AR Category

Precipitation % Change
Relative to NOAA Atlas 14

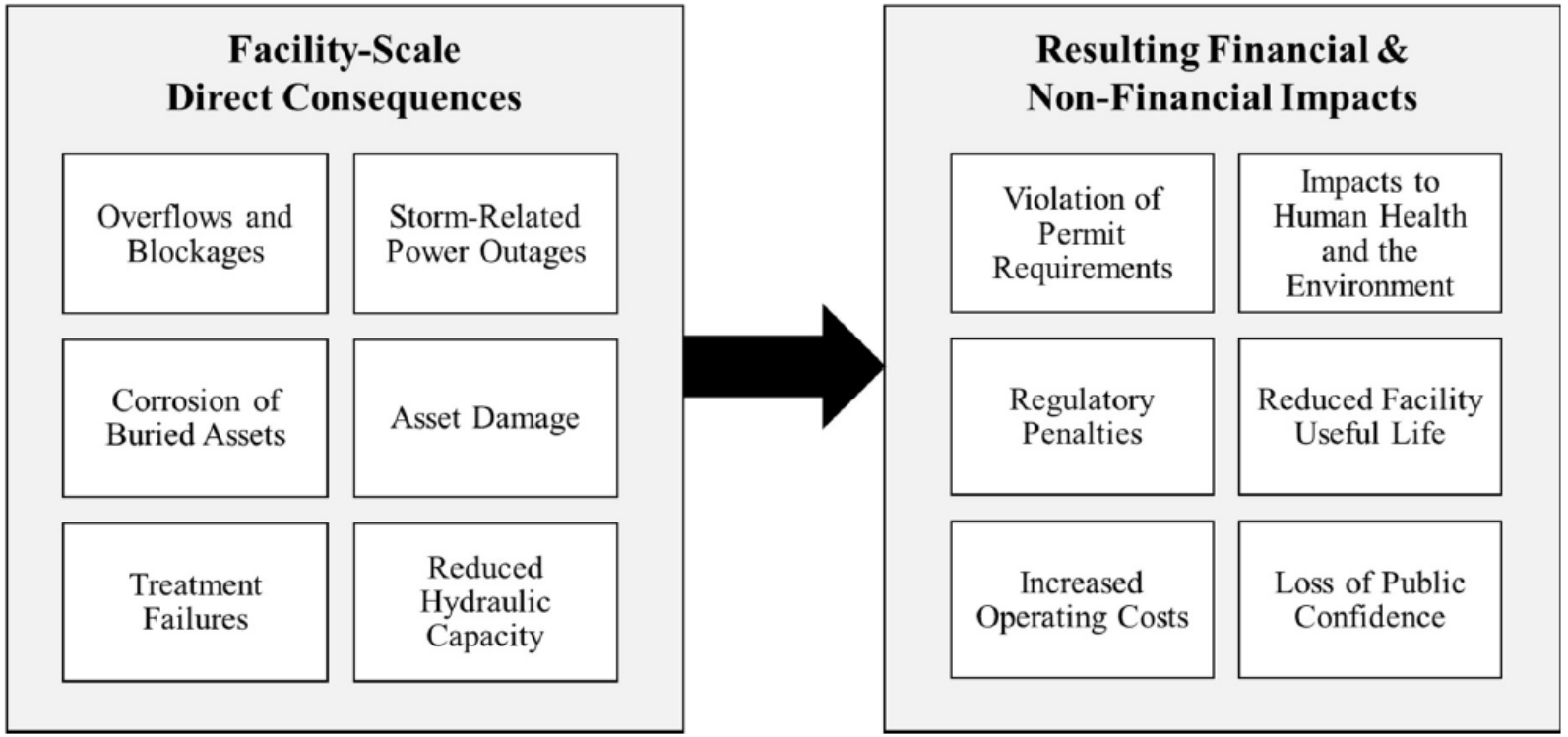
		10-yr	100-yr
2050	3-hr	21.6%	25.8%
	24-hr	17.9%	22.1%
2060	3-hr	27.8%	32.7%
	24-hr	22.2%	26.8%
2070	3-hr	33.7%	39.3%
	24-hr	25.9%	31.2%
2080	3-hr	40.7%	47.1%
	24-hr	30.7%	36.6%
2090	3-hr	49.6%	56.9%
	24-hr	37.1%	43.7%
2100	3-hr	59.0%	67.2%
	24-hr	43.6%	51.0%

- 3-hour duration storms are projected to increase faster than the 24-hr duration storm
- Today's 100-year storm will be a ~25-year storm by 2050, and a ~10-year storm by 2100.

Considerations for Wastewater Facilities and Collection Systems

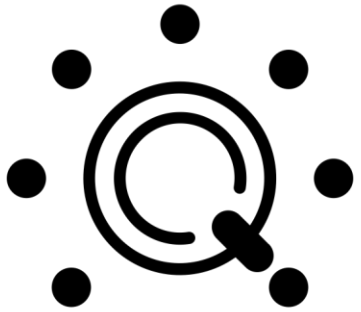


U.S. Sea Level Rise Inundation: Scenario Intermediate—Year 2030 (NOAA et al., 2022)



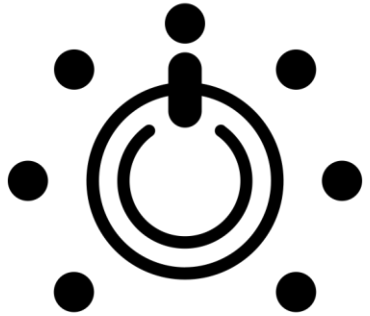
Note: Based on Ackerly et al., 2018; Hughes et al., 2021

Three Elements for Climate Adaptive Planning and Design



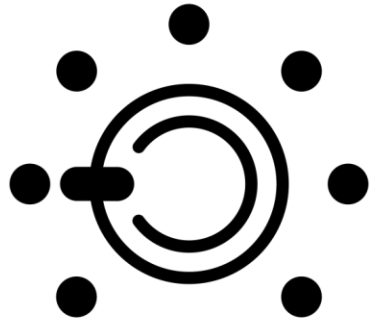
Planning Horizon

What time frame are we designing for?



Climate Scenarios

What climate scenario should we select?



Level of Service (Design Criteria)

What design criteria can the project satisfy? What residual risk can the system tolerate?

Recommended Planning Horizons

Design life

Period which the asset is expected to function within specified parameters; theoretical concept that differs from the standard service / operational life of most assets (e.g., 30-years)

Service life (useful life)

The period the asset can remain in service, considering regular maintenance and repair (e.g., 50+ years)

Asset / Project-Based

Long-term planning

The long-haul time horizon that guides infrastructure investments and adaptation strategy implementation (e.g., 2100+)

System-Based

Climate Science: New "Most Probable High-End" Scenario

Scenario	Description	Paired With	Global Temp. Change
SSP2	a middle of the road, socioeconomic trends stay the same, unequal growth, slow progress	RCP 4.5	+2.1° to 3.5° C
SSP3	regional rivalry and conflicts, countries focus on their own goals at the expense of others	RCP 7.0	+2.8° to 4.6° C
SSP5	fossil-fueled development, economic and social innovation and development coupled with fossil fuel exploitation	RCP 8.5	+3.3° to 5.7° C

- **SSP3-7.0 Selected for the 5th California Climate Change Assessment**
- **Used in New and Upcoming State Tools**
- **Recommend using SSP3-7.0 as the design and planning "Goal"**

Tune the Design Criteria (SSP3-7.0)

- **Evaluate Design Criteria**
- Adjust the Planning Horizon
- Find the Project Horizon

2000 – 2025 | 2040 | 2050 | 2060 | 2070 | 2080

Today

Existing Design Criteria

Iterative Design Process Determines Feasible Design Criteria

Target Planning Horizon

Future Design Criteria Goal

Tune the Design Criteria (SSP3-7.0)

- Evaluate Design Criteria
- **Adjust the Planning Horizon**
- Find the **Project Horizon**

2000 – 2025 | 2040 | 2050 | 2060 | 2070 | 2080

Today

Existing Design Criteria

Project Horizon (SSP3-7.0)

All Future Hazards

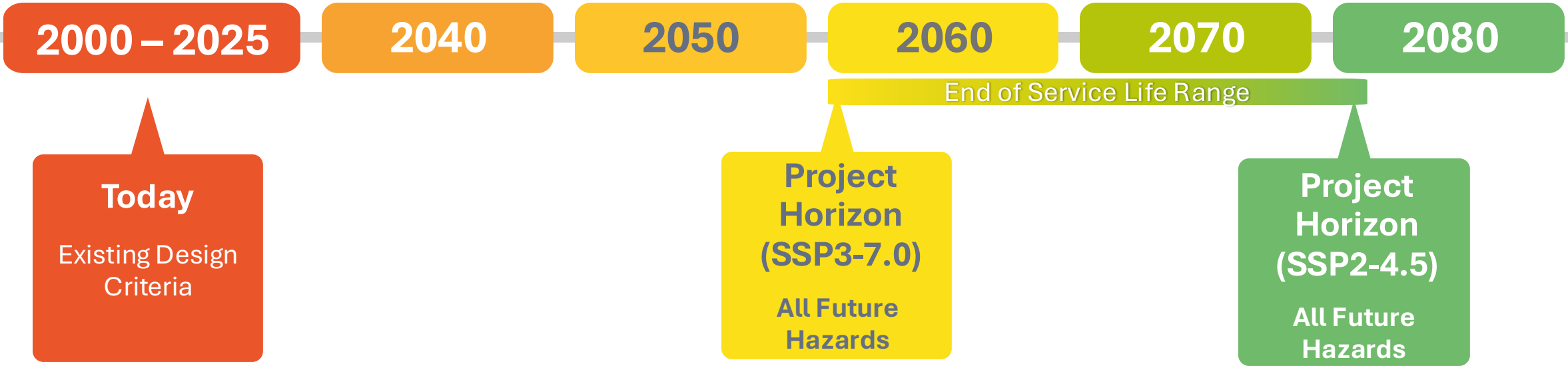
Iterative Design Process Determines Feasible Design Criteria

Target Planning Horizon

Future Design Criteria Goal

Understand and Document the Range

- **Target Planning Horizon:** 2080 (SSP3-7.0)
- **Project Horizon:**
  - ✓ **2060** (SSP3-7.0)
  - ✓ **2082** (SSP2-4.5)



Precipitation Design Storm Scaling Factor Approach

Target Planning Horizon 2080 (SSP3-7.0)

The design team initiates design with a 2080 Planning Horizon using the SSP3-7.0 climate projections.

SSP3-7.0 2080			
Duration	**2 year**	**10 year**	**100 year**
15-min	36.4%	40.4%	46.4%
30-min	36.5%	40.5%	46.5%
60-min	36.0%	39.9%	45.9%
2-hr	33.9%	37.8%	43.8%
3-hr	32.9%	36.8%	42.7%
6-hr	28.7%	32.5%	38.2%
12-hr	26.1%	29.7%	35.3%
24-hr	24.5%	28.0%	33.6%

Design Storm = 10-year, 24-hour
Scaling Factor = 28%
Sea Level Rise = 3 feet
Groundwater Rise = < 3 feet

Evaluate the Design Criteria

Through analysis, the design team determines only a 19% scaling is feasible. This is equivalent to the projected 2060 condition for SSP3-7.0.

SSP3-7.0 2060			
Duration	**2 year**	**10 year**	**100 year**
15-min	25.9%	28.5%	33.1%
30-min	25.6%	28.3%	32.9%
60-min	24.4%	27.1%	31.6%
2-hr	21.9%	24.5%	28.9%
3-hr	21.2%	23.8%	28.2%
6-hr	18.5%	21.0%	25.3%
12-hr	17.6%	20.1%	24.4%
24-hr	16.8%	19.3%	23.6%

Design Storm = 10-year, 24-hour
Scaling Factor = 19%
Sea Level Rise = 1.8 feet
Groundwater Rise = < 1.8 feet

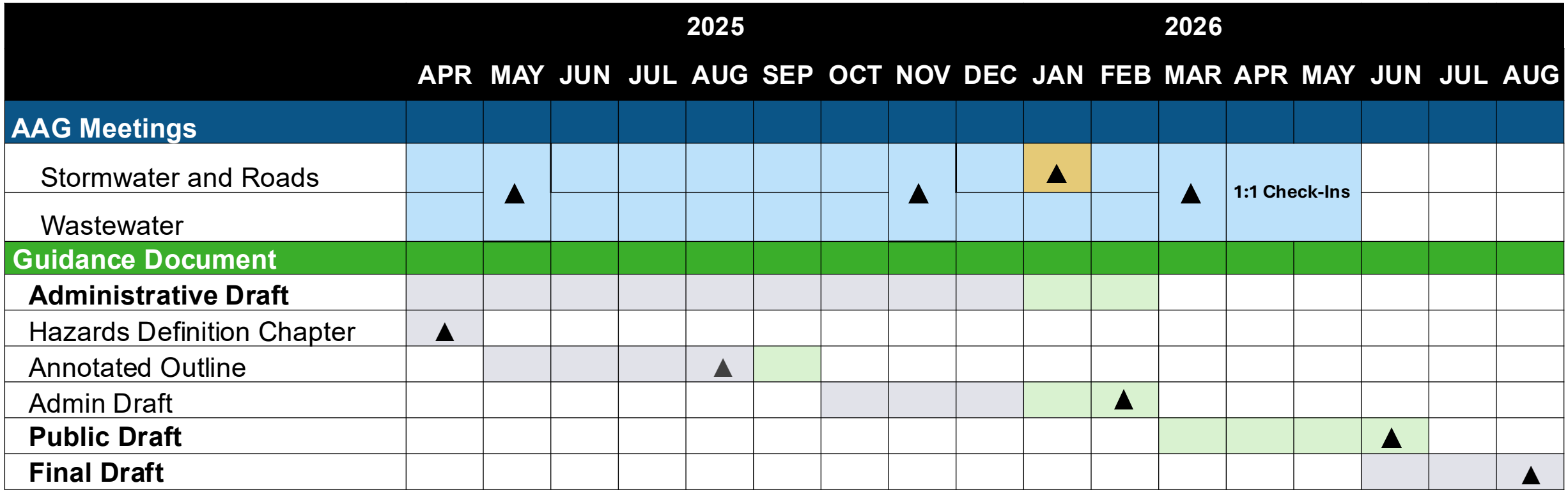
Understand the Range

The design team determines that this is equivalent to the 2082 condition for SSP2-4.5.

SSP2-4.5 2082			
Duration	**2 year**	**10 year**	**100 year**
15-min	25.9%	28.7%	33.3%
30-min	25.7%	28.4%	33.0%
60-min	24.4%	27.2%	31.8%
2-hr	21.9%	24.4%	28.9%
3-hr	21.2%	23.7%	28.2%
6-hr	18.3%	20.9%	25.3%
12-hr	17.6%	20.1%	24.4%
24-hr	16.8%	19.3%	23.6%

The project is likely to remain in service until sometime between 2060-2082.

Project Schedule and Next Steps



Next Steps

1. Incorporate feedback from today
2. Develop Administrative Draft document
3. Administrative Draft for AAG review in late Feb

Project Team

OneShoreline
Building Solutions for a Changing Climate

Len Materman, CEO
Summer Bundy, Director of Projects
Johnathan Perisho, Project Manager
Dr. Stephanie Lau, Grant & Communications Advisor

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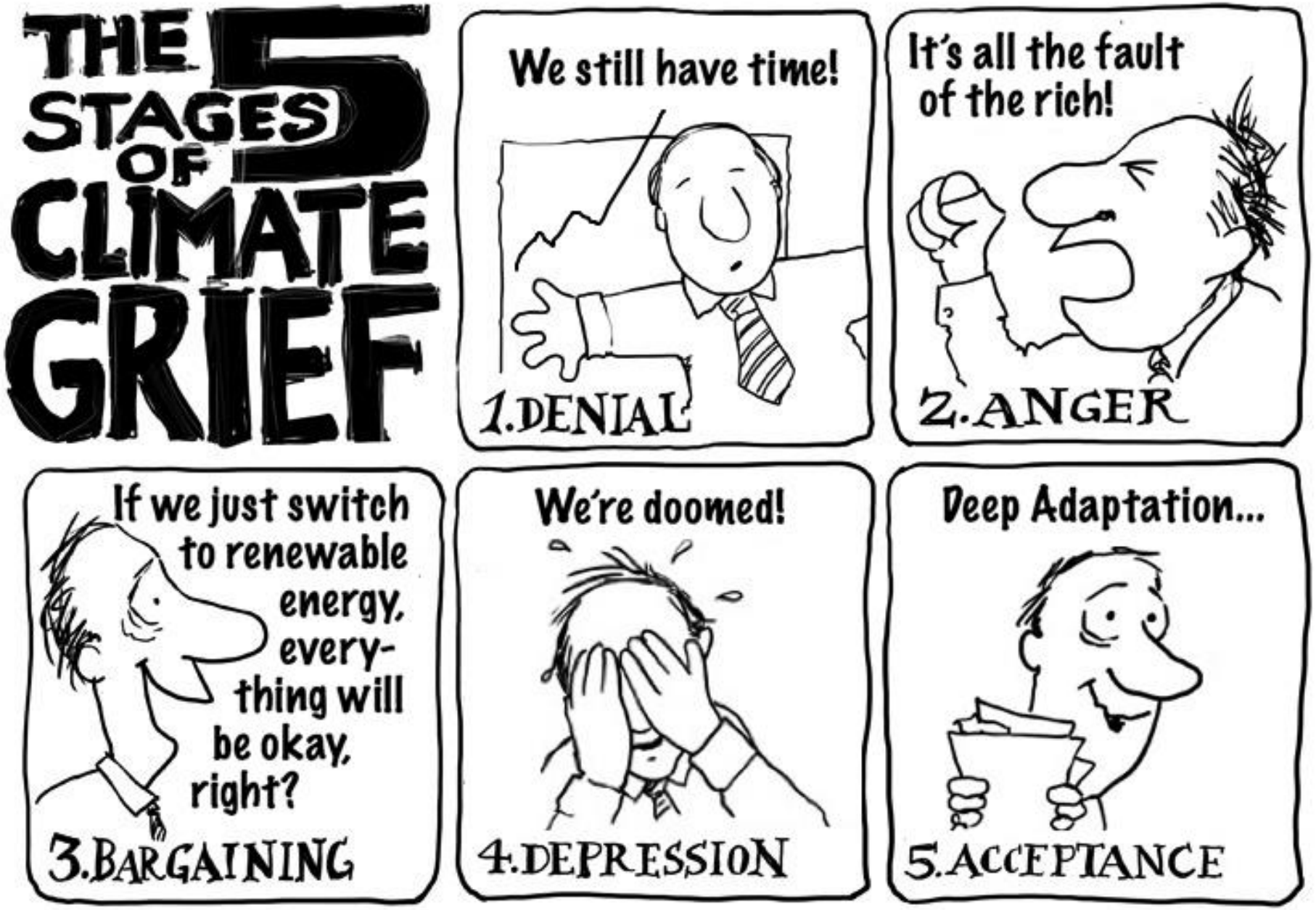
THE 5 STAGES OF CLIMATE GRIEF
We still have time!
1. DENIAL
It's all the fault of the rich!
2. ANGER
If we just switch to renewable energy, everything will be okay, right?
3. BARGAINING
We're doomed!
4. DEPRESSION
Deep Adaptation...
5. ACCEPTANCE