GROUNDWATER and SEA LEVEL RISE

Kristina Hill, PhD UC Berkeley kzhill@berkeley.edu



Groundwater is water from rainfall that is stored in the soil.

The "water table" refers to the shallowest layer of that water, which often lies just below the surface of the soil.

GROUNDWATER DATABASE (GAMA)

State Water Board well locations and tidal datums with groundwater depth data.



GROUNDWATER MAPPING RESULTS

Bay Area locations where groundwater is *already* within 3 feet of the land surface, shown in red.



Mapping results from UC Berkeley study:

1 meter SLR = approx. **28 sq. miles** of land flooded by seawater.

An *additional* **40 sq. miles** could flood by **groundwater**.

Even with new walls and levees, rising groundwater could still impact a total of **57 sq. miles** of today's dry land with 1 m SLR.

(Plane, Hill and May 2019)









Rising groundwater can:

- Infiltrate underground sanitary and storm sewer pipes, cause foundations to heave, and require extensive underground waterproofing
- Increase the risk of soil liquefaction in a seismic event
- **Remobilize old soil contaminants**, creating problems for public health and Bay ecosystem health
- Emerge at the surface as ponded water, or discharge to creeks and cause additional creek flooding.

Liquefaction risks











Contamination risks



Coliseum Area groundwater and potential contaminants

SLR maps omit groundwater







96'

84

77

66'

24

Get Involved 🎎 🧃 🙊 📑 🕒 Select Language 🔻

nter address or location.

Q



At the county scale, these scenarios present average water levels that are representative of what could occur along each county's shoreline.

LEGEND

Toggle layers on/off and control transparency below. Use Slider at left to control Total Water Level displayed.



Areas outside of sea level rise and storm surge flooding extent could potentially be subject to riverine flooding, rainfall runoff events, or other flooding hazards. Learn More.

Shoreline Overtopping ?



Sea Level Rise (SLR) Driven Groundwater Inundation in the Coastal Plain of Marin City



Sea Level Rise (SLR) Driven Groundwater Inundation in the Coastal Plain of Marin City



Sea Level Rise (SLR) Driven Groundwater Inundation in the Coastal Plain of Marin City



Adaptation strategies

Living with more water, instead of building walls and pumps



Hafencity, Hamburg

Steigereiland, Amsterdam

in difficult

4 3

1

- 0 3

1 3

200

TITIT

C Team, Resilient by Design Challenge 2019 kland Coliseum Area Proposal

