Sea level rise and rising groundwater

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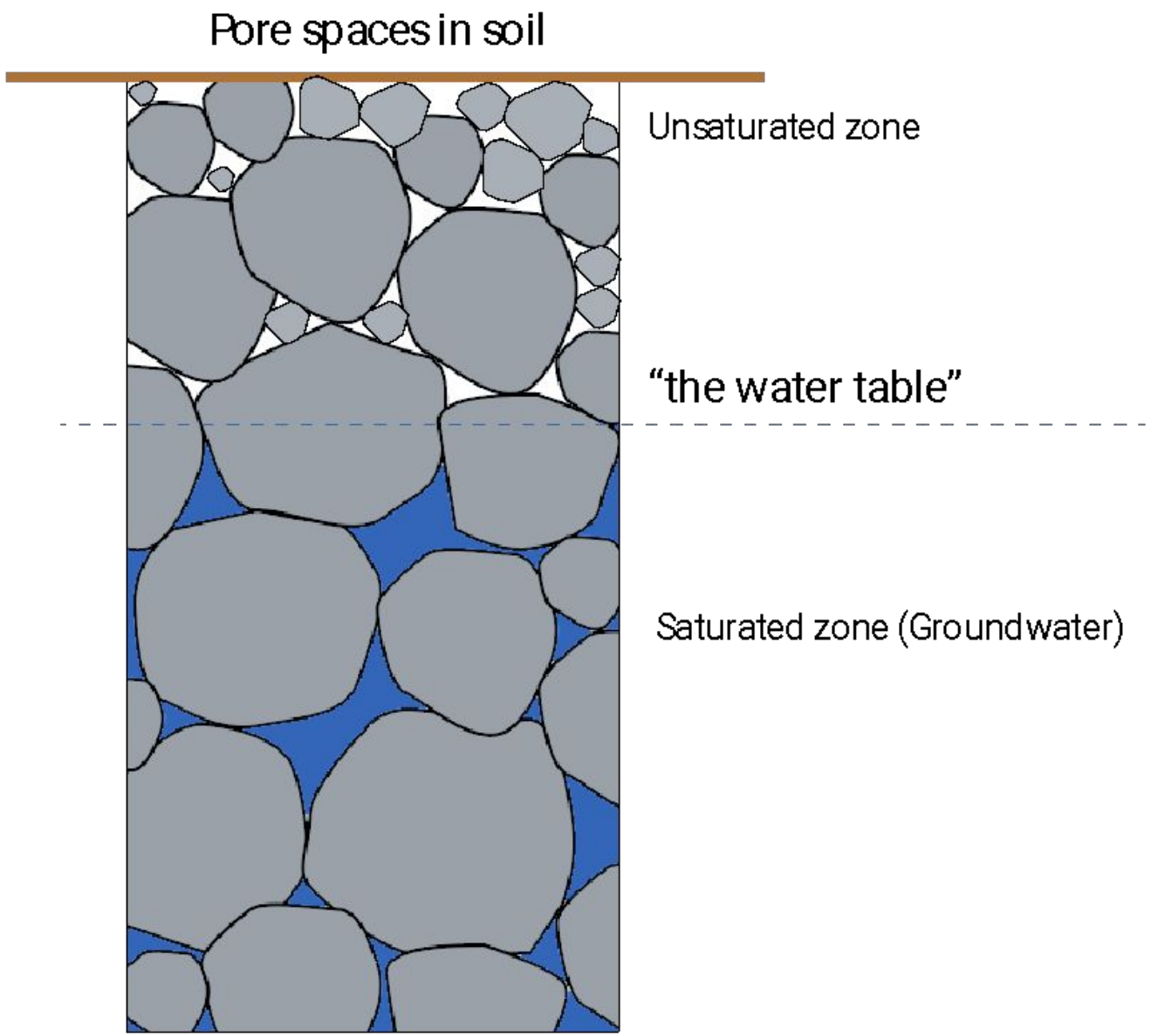
Photo: Groundwater flooding at high tide, Marina Blvd., San Leandro 2022



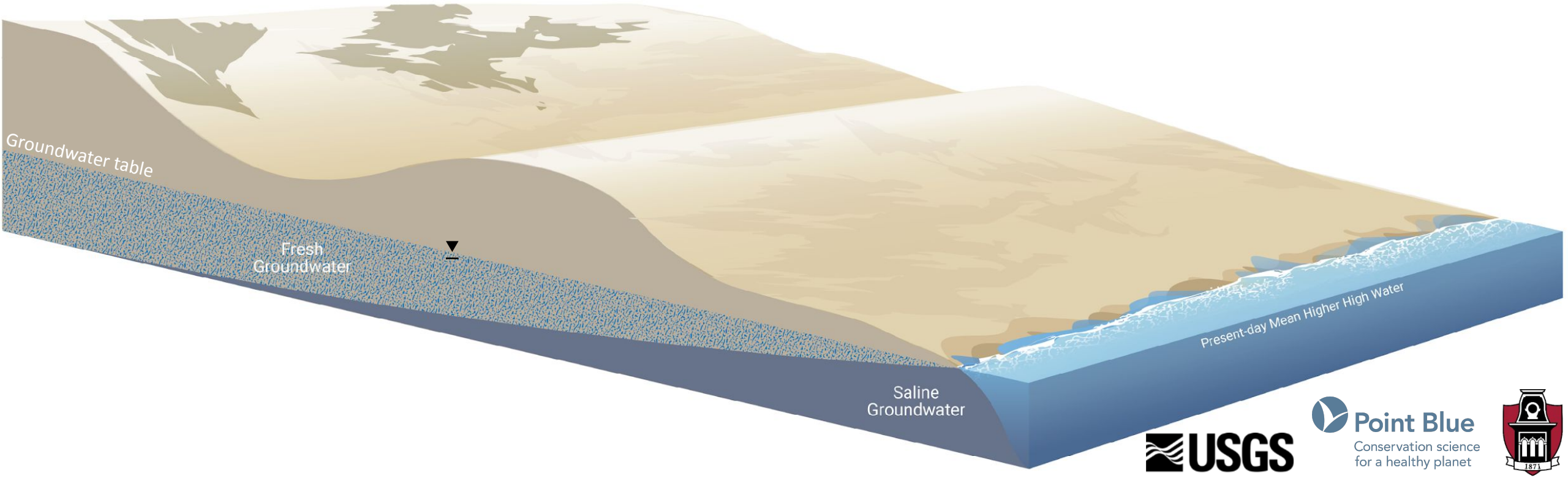
Shallow groundwater is water from rainfall that is stored in the soil.

The “water table” is the shallowest layer of that water, which often lies just below the surface.

Groundwater infiltration into a storm or sanitary sewer pipe

Source: American Public Works Association

How sea-level rise affects the groundwater table



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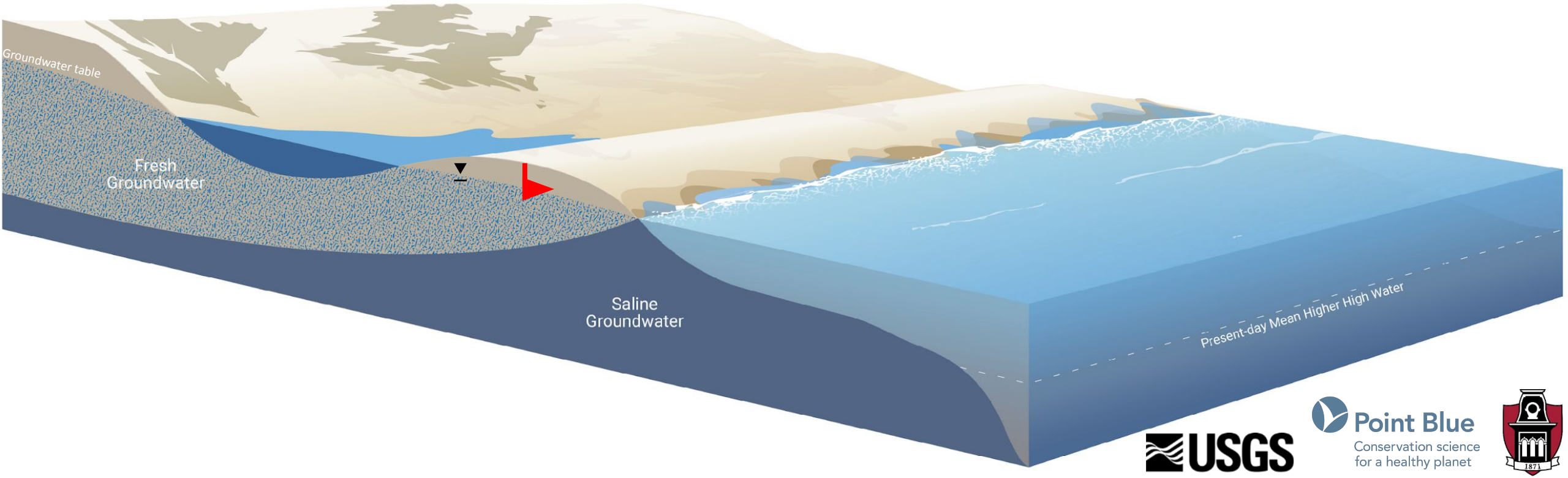
How sea-level rise affects the groundwater table



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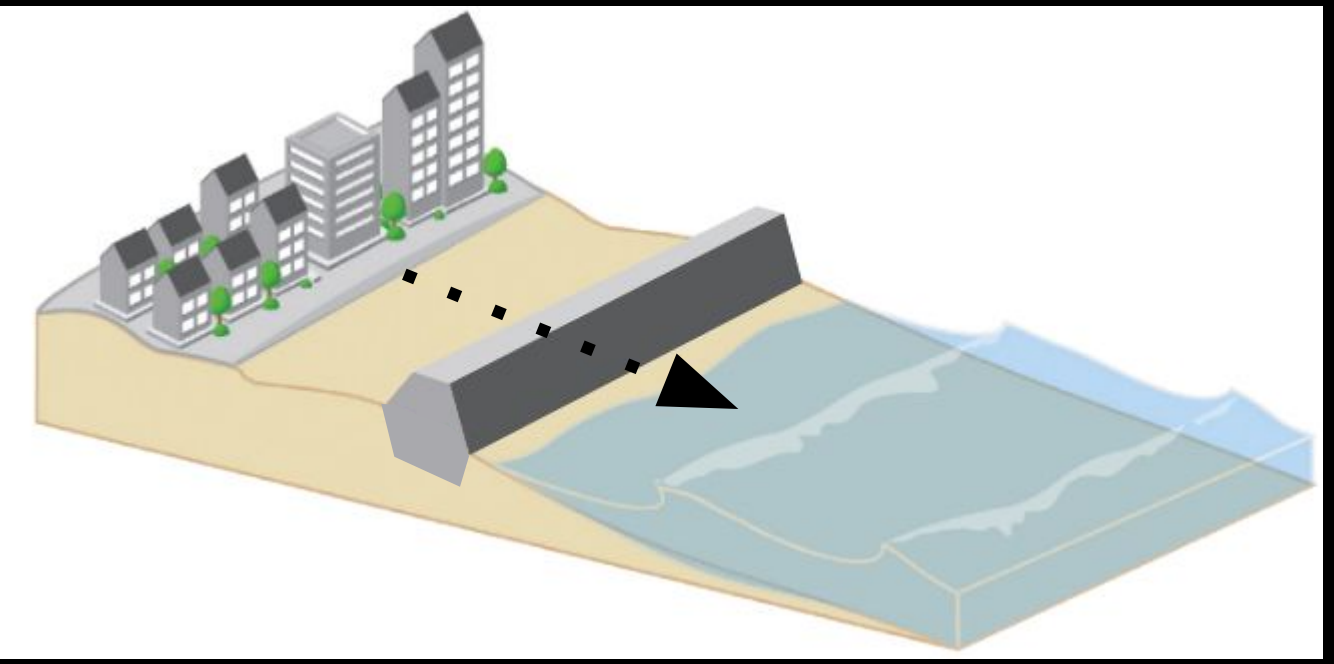
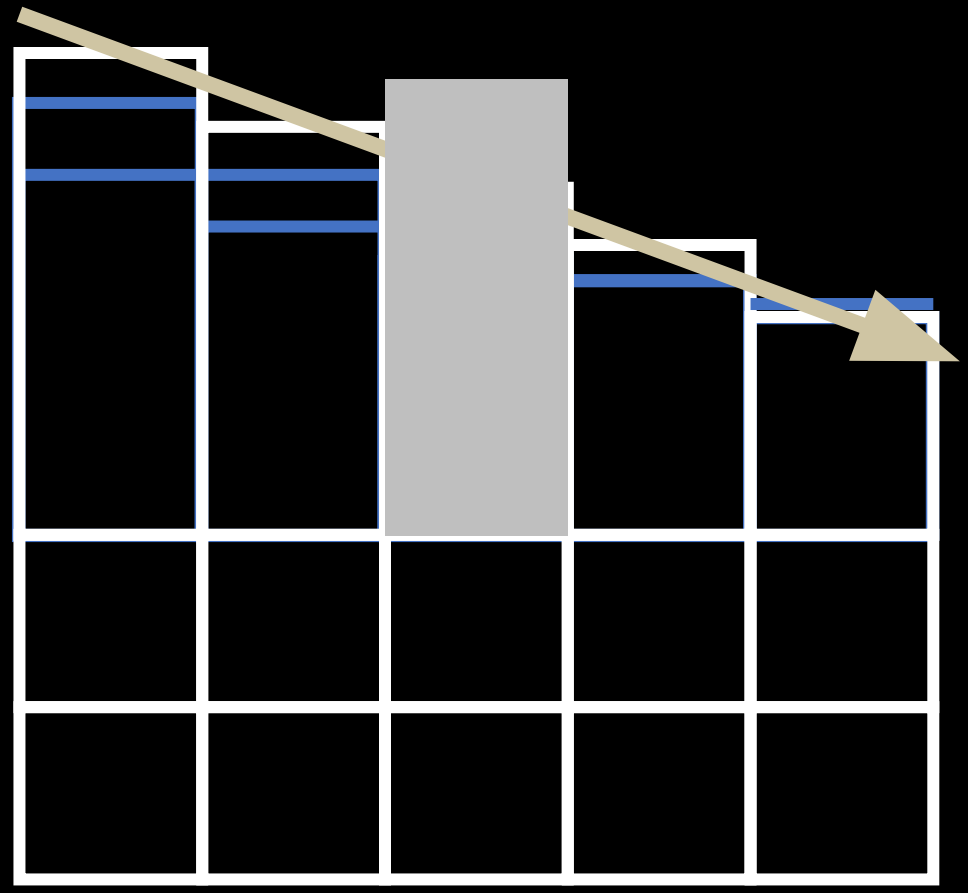
Modeling coastal groundwater and adaptation strategies



Seawall with foundation



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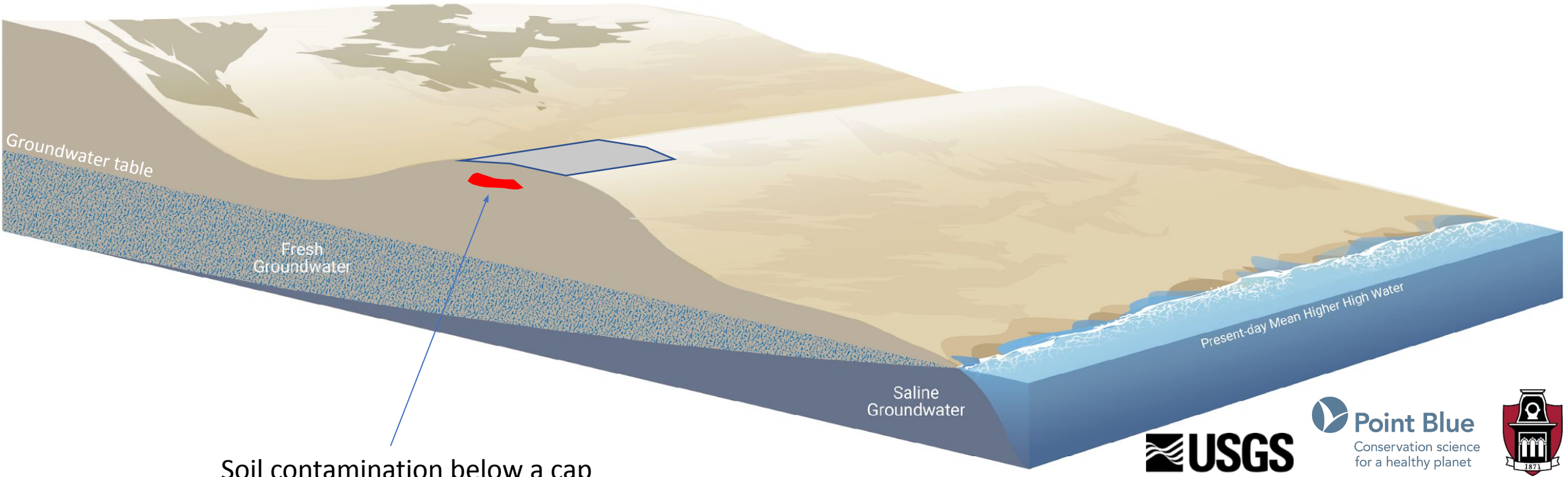
Slide by Kevin Befus/Patrick Barnard, USGS 2020

How sea-level rise can affect contaminants in soil



Soil contamination below a cap

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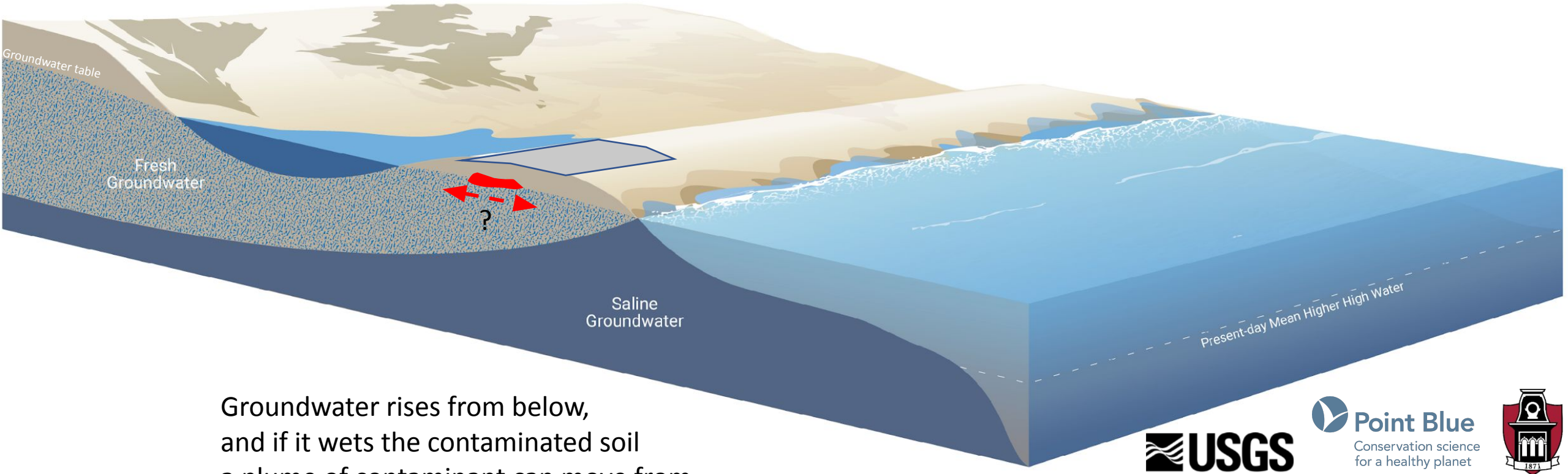

Groundwater rises from below,
and if it wets the contaminated soil
a plume of contaminant can move from
the site into its surroundings.

USGS slide modified by K. Hill, UC Berkeley

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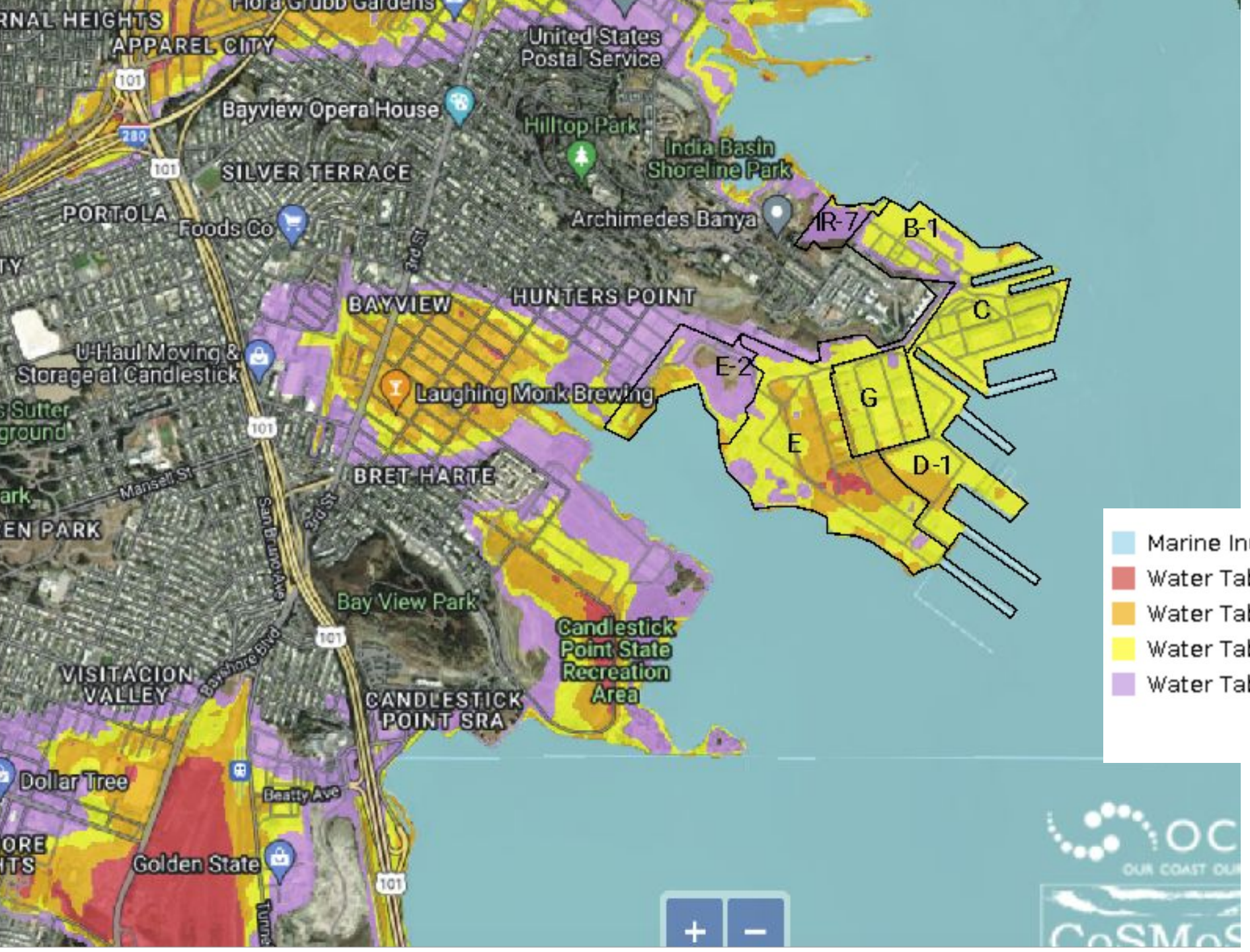
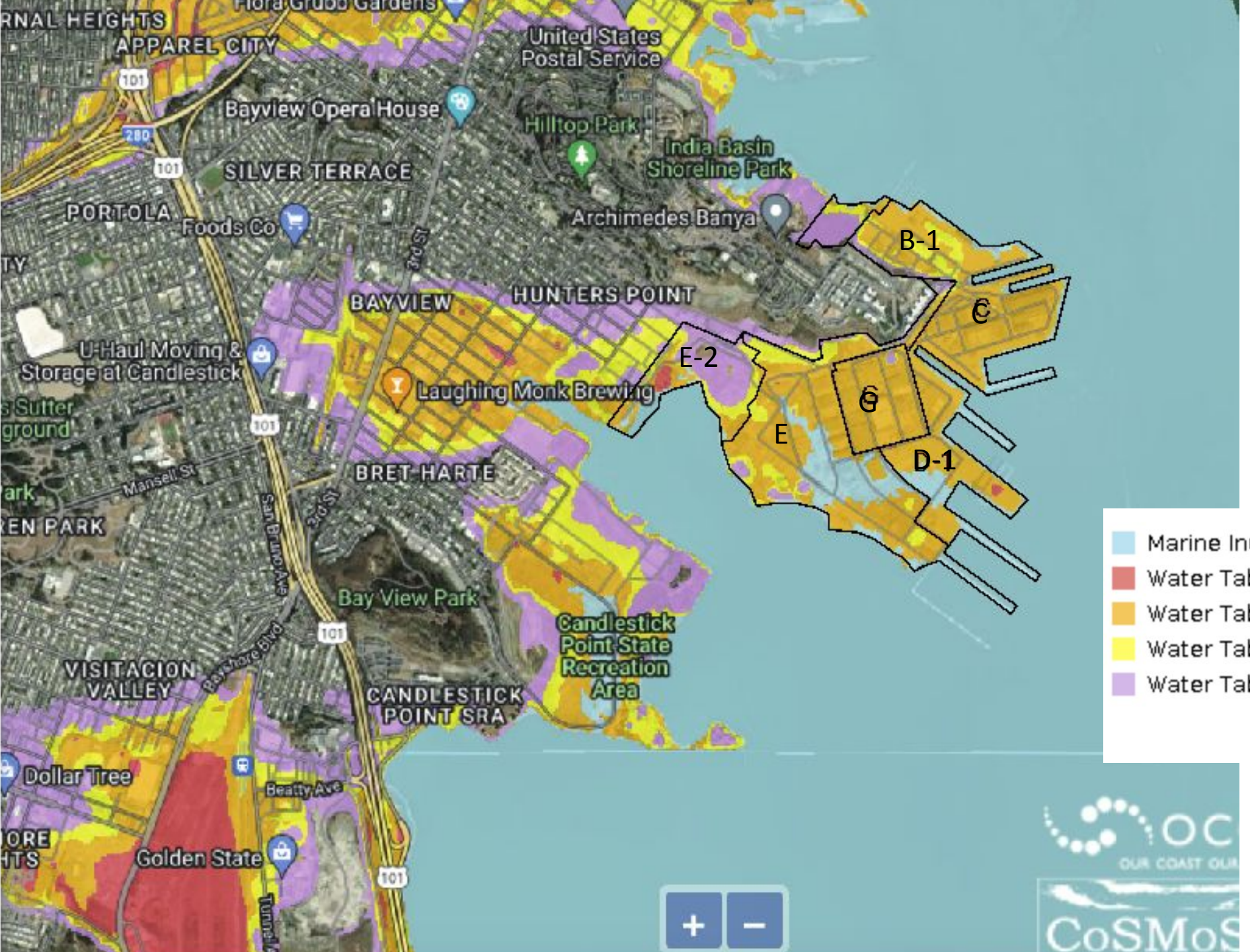


This map of the depth to groundwater under Hunter's Point was created by scientists at the US Geological Survey in 2020 and was published in a peer-reviewed journal.

Current conditions

Link to map: https://ourcoastourfuture.org/hazard-map/



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3.2 feet of sea level rise

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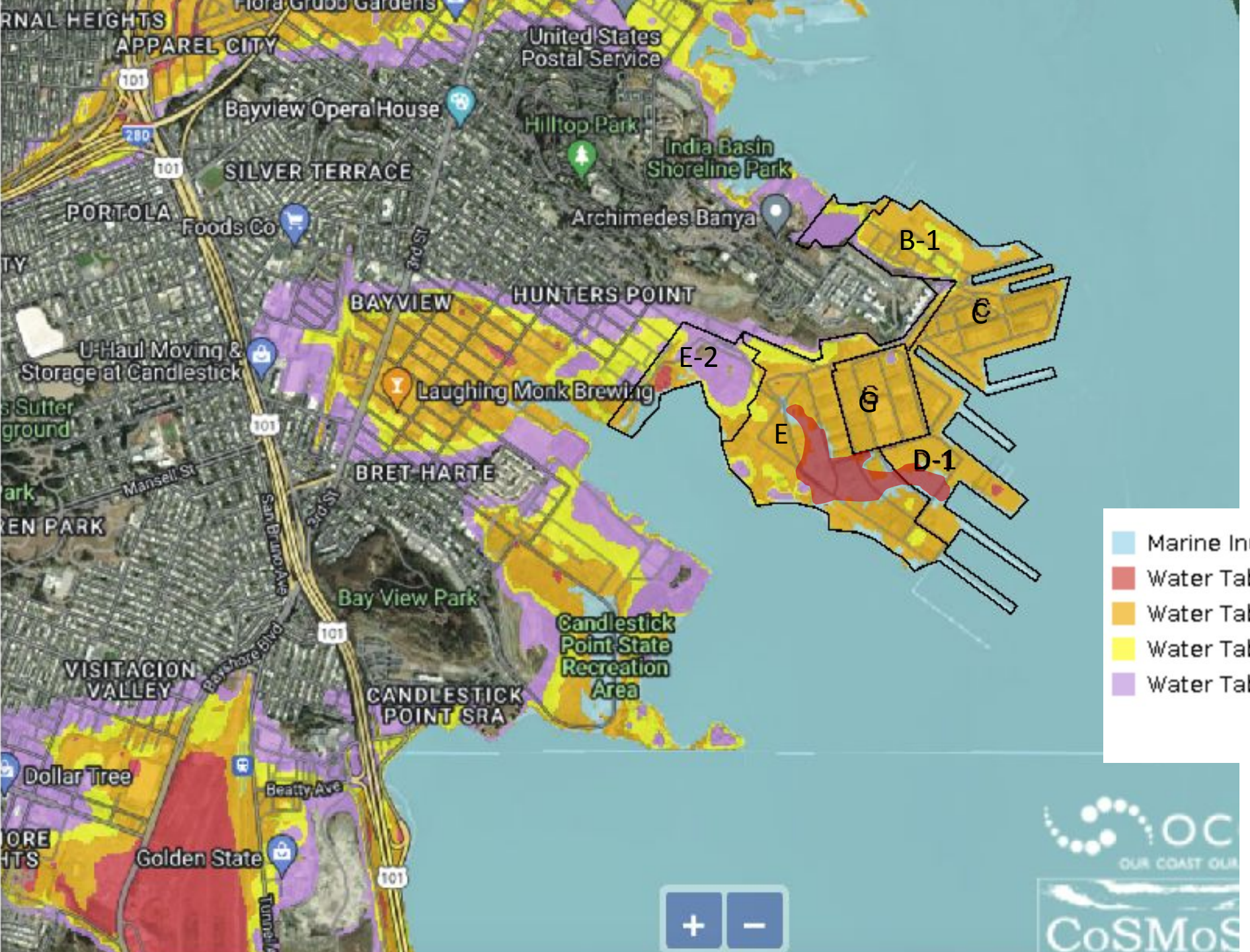

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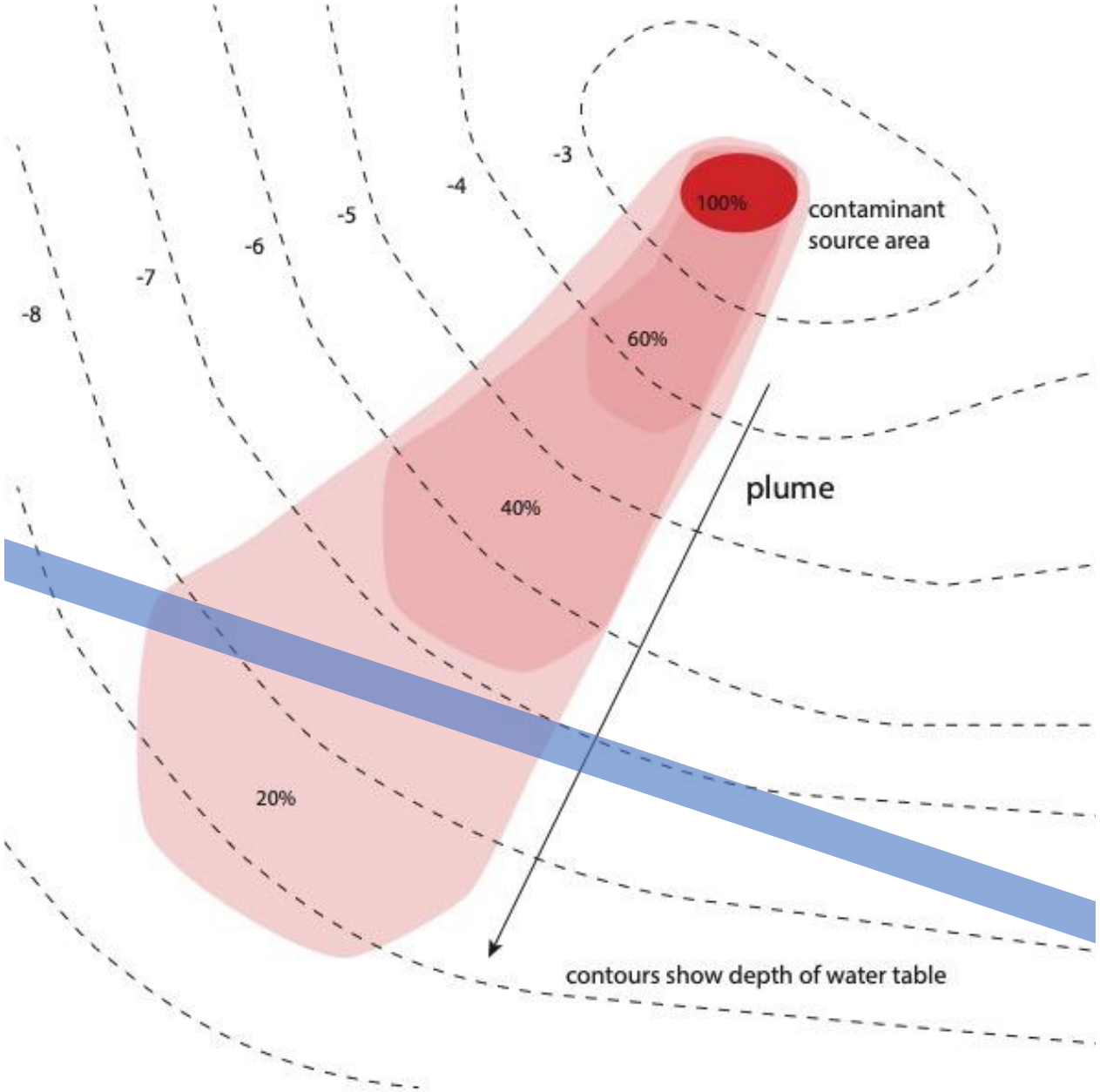
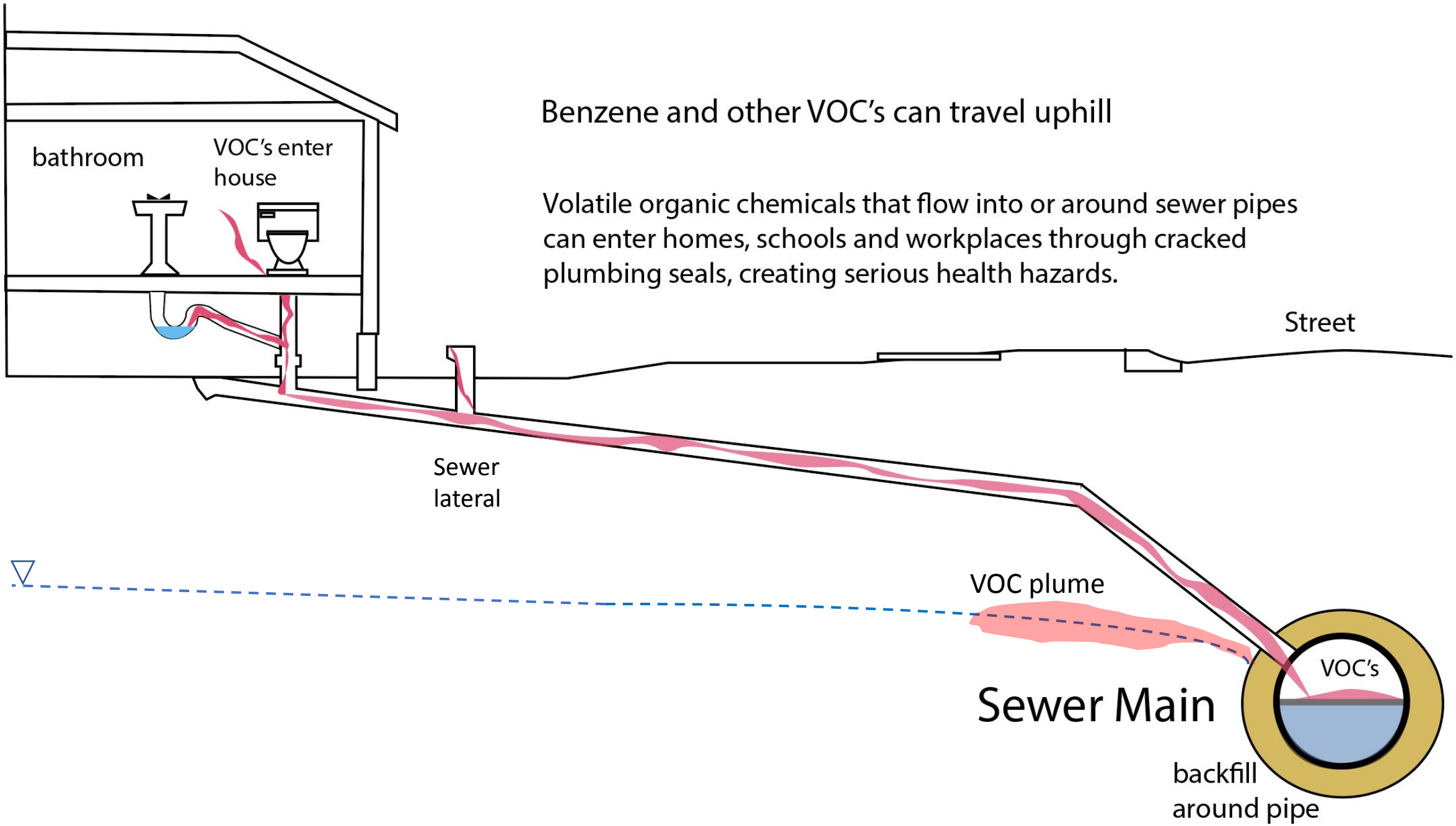


Plumes of contaminated groundwater will move at different speeds in different soil and tidal conditions.

If the plume intersects with a sewer line or other underground trenches, volatile organic chemicals (VOC's) can travel uphill in the trench or pipe and into buildings, hundreds of feet away.


Benzene and other VOC's can travel uphill
Volatile organic chemicals that flow into or around sewer pipes can enter homes, schools and workplaces through cracked plumbing seals, creating serious health hazards.
bathroom
VOC's enter house
Street
Sewer lateral
VOC plume
VOC's
Sewer Main
backfill around pipe

Summary

As the sea level rises, groundwater will also rise even if levees or seawalls are present. This will create serious impacts underground, long before water emerges at the surface.

- Infiltration into storm and sewer pipes, reducing capacity and increasing corrosion
- Potential to mobilize legacy contaminants in soil creating new health risks for people and the Bay
- Potential impacts on building foundations and basements, and the intensity of earthquake shaking
- Reduced ability of the soil to absorb rainwater, leading to flooding