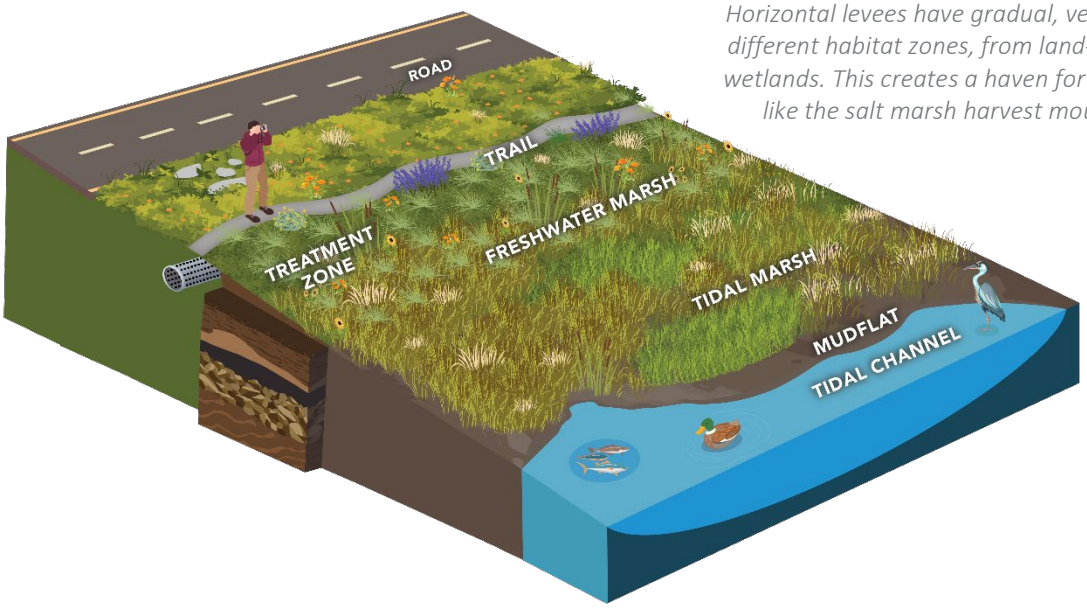
Palo Alto Horizontal Levee

First of Its Kind, Leading Bay Area Sea Level Rise Planning

The City of Palo Alto Horizontal Levee is a permanent pilot project that uses a nature-based approach to providing protection against sea level rise and restoring habitat in the San Francisco Bay. Located in the Palo Alto Baylands, this levee is the first of its kind to use treated wastewater for irrigation. Learnings from this pilot will inform future "living levee" designs and help communities adapt to rising sea levels using similar nature-based systems.

WHAT IS A HORIZONTAL LEVEE?

Designed with a gradual slope and covered with native plants, horizontal levees are a nature-based alternative to traditional levees that use earth, concrete, steel, or rocks. This alternative helps reduce wave impacts on the flood control levees facing the Bay.



Horizontal levees have gradual, vegetated slopes that create different habitat zones, from land-based ecosystems to tidal wetlands. This creates a haven for native plants and animals, like the salt marsh harvest mouse and Ridgway's Rail.

PROJECT OBJECTIVES

1. Restore habitat for native plants and wildlife along Harbor Marsh in the Palo Alto Baylands.
2. Prepare for future sea level rise by creating a gradual slope that supports sediment buildup.
3. Reduce wave impacts and protect existing levees.
4. Provide additional wastewater polishing treatment.
5. Offer recreational benefits with nature.
6. Inspire future regional projects with pilot findings.

CITY OF PALO ALTO

San Francisco ESTUARY PARTNERSHIP

PROJECT PARTNERS

This project is a long-standing collaboration between the City of Palo Alto and the San Francisco Estuary Partnership. It was made possible by generous grants from the U.S. Environmental Protection Agency and California Coastal Conservancy. The City is collaborating with many community-based organizations, universities, and agencies on the ongoing community engagement and scientific study of the levee. For a list of project partners, visit PaloAlto.gov/HorizontalLevee

REGIONAL FLOOD CONTROL

The City partners with local, state, and federal agencies on flood protection improvement and sea level rise adaptation projects, including the Strategy to Advance Flood protection, Ecosystems and Recreation along San Francisco Bay (SAFER Bay) Project, the South San Francisco Bay Shoreline Project (Shoreline Study), and the Santa Clara County Subregional Shoreline Adaptation Plan. These projects not only help to improve flood control levees and plan for future conditions, but also incorporate natural infrastructure and habitat restoration. The Palo Alto Horizontal Levee pilot project will provide insights on how nature-based solutions can shape future flood control levee designs on a regional scale.

TREATED WASTEWATER

The Regional Water Quality Control Plant is owned and operated by the City of Palo Alto and treats 20 million gallons of sewage per day from 244,000 residents and businesses in its service area. Located on 25-acres near the Baylands Nature Preserve, the Plant serves as a regional plant for six partner agencies (East Palo Alto Sanitary District, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford University).

Aerial of the Palo Alto Regional Water Quality Control Plant and adjacent project area.

The Palo Alto Horizontal Levee is the first of its kind to use highly treated wastewater to irrigate native plants on the vegetated slope before its discharge to the San Francisco Bay. Effluent mimics freshwater to create a grassy wet meadow, freshwater marsh, and riparian scrub habitat that once flourished along the shoreline before the development of urban infrastructure. While wastewater is already treated at the Plant to meet strict standards, the pilot is expected to further reduce nitrogen and contaminants of emerging concern prior to its discharge into the Bay.