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Ecotone

Project

FEBRUARY 18, 2021



Background

Rising Sea Levels

The National Research Council projects a regional rise for San Francisco Bay of 5-24 inches by 2050 and 17-66 inches by 2100. The National Oceanic and Atmospheric Administration list the Bay Area as one of the top ten most vulnerable metropolitan regions in the country.

The Idea

The idea was to create a new type of levee to mimic the natural slope of historic wetlands into upland areas. If planted with sedges and grasses, and irrigated with treated wastewater, this wedge of habitat, aka "ecotone slope", could do the following:

- slow down waves, resist floods, and protect infrastructure
- remove unwanted harmful nutrients from treated wastewater, and remove trace amounts of pharmaceuticals and synthetic hormones that are often present in the effluent – contaminants of emerging concern to the Bay ecosystem
- provide a renewed habitat for wetland animals

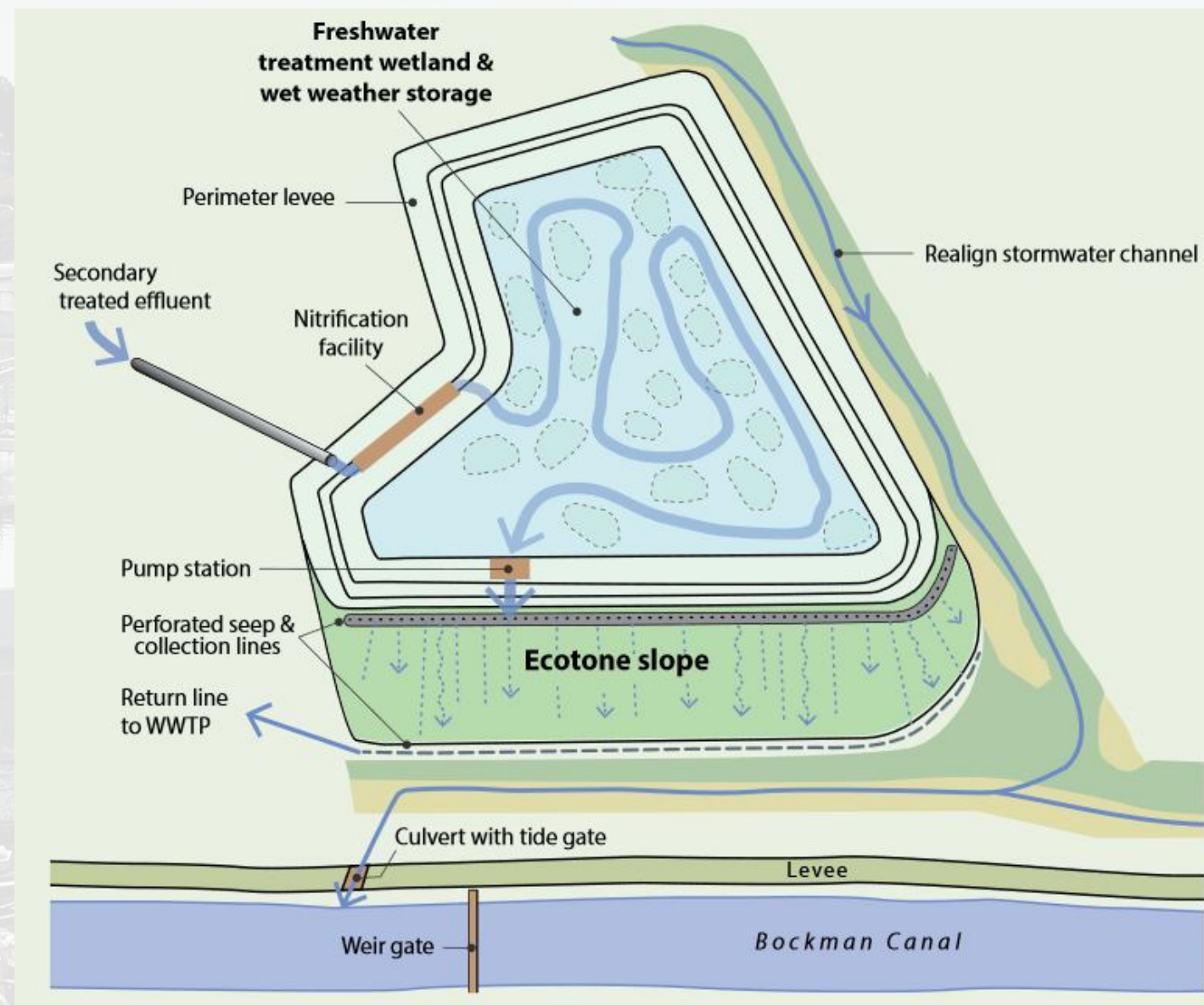


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The Plan

The project turned a degraded diked bayland behind the Castro Valley/Oro Loma Wastewater Treatment Plant (WWTP) into an outdoor laboratory. This project created two things:

1. A two-acre wetland basin that removes unwanted nutrients from wastewater and provides extra wet weather storage capacity.
2. On the other side of the basin, an experimental levee that is divided into 12 basins.



PROJECT PARTNERS & FUNDERS

Oro Loma Sanitary District
Castro Valley Sanitary District
East Bay Dischargers Authority
California Dept. of Water Resources
San Francisco Estuary Partnership
The Bay Institute
Save The Bay

PRIMARY CONSULTANTS

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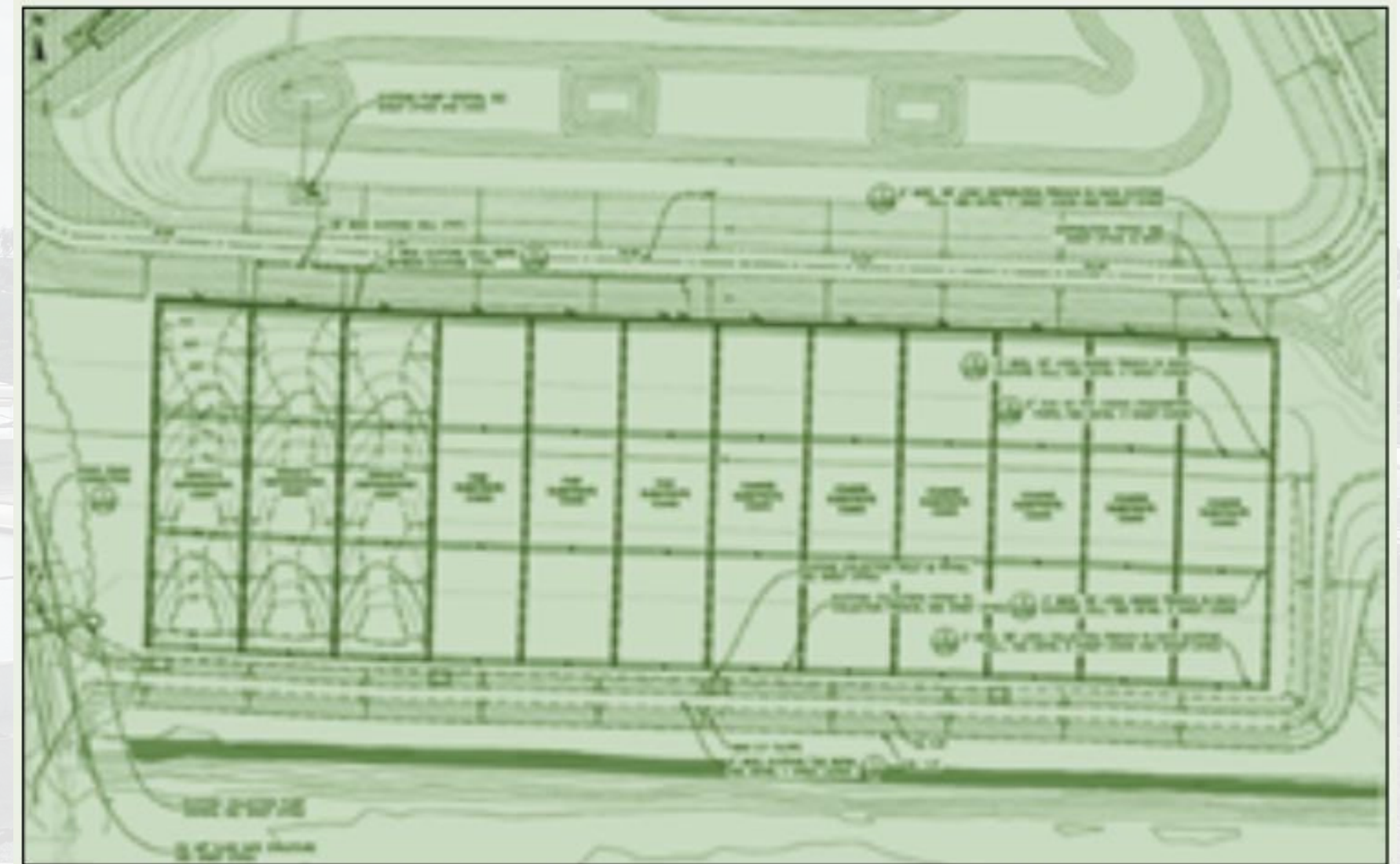




The Science

Each of the 12 experimental beds of the ecotone slope is set up like a sandwich. The bottom layer is impermeable clay, the middle layer is porous gravel, and the top layer is a mixture of bay mud and sandy soil where plants can grow roots.

This experiment uses plants and soil microbes to remove unwanted nutrients from treated wastewater coming out of the WWTP. After passing through a conventional treatment wetland full of cattails and bulrushes, scientists estimate 10-30 percent of unwanted nutrients are removed.



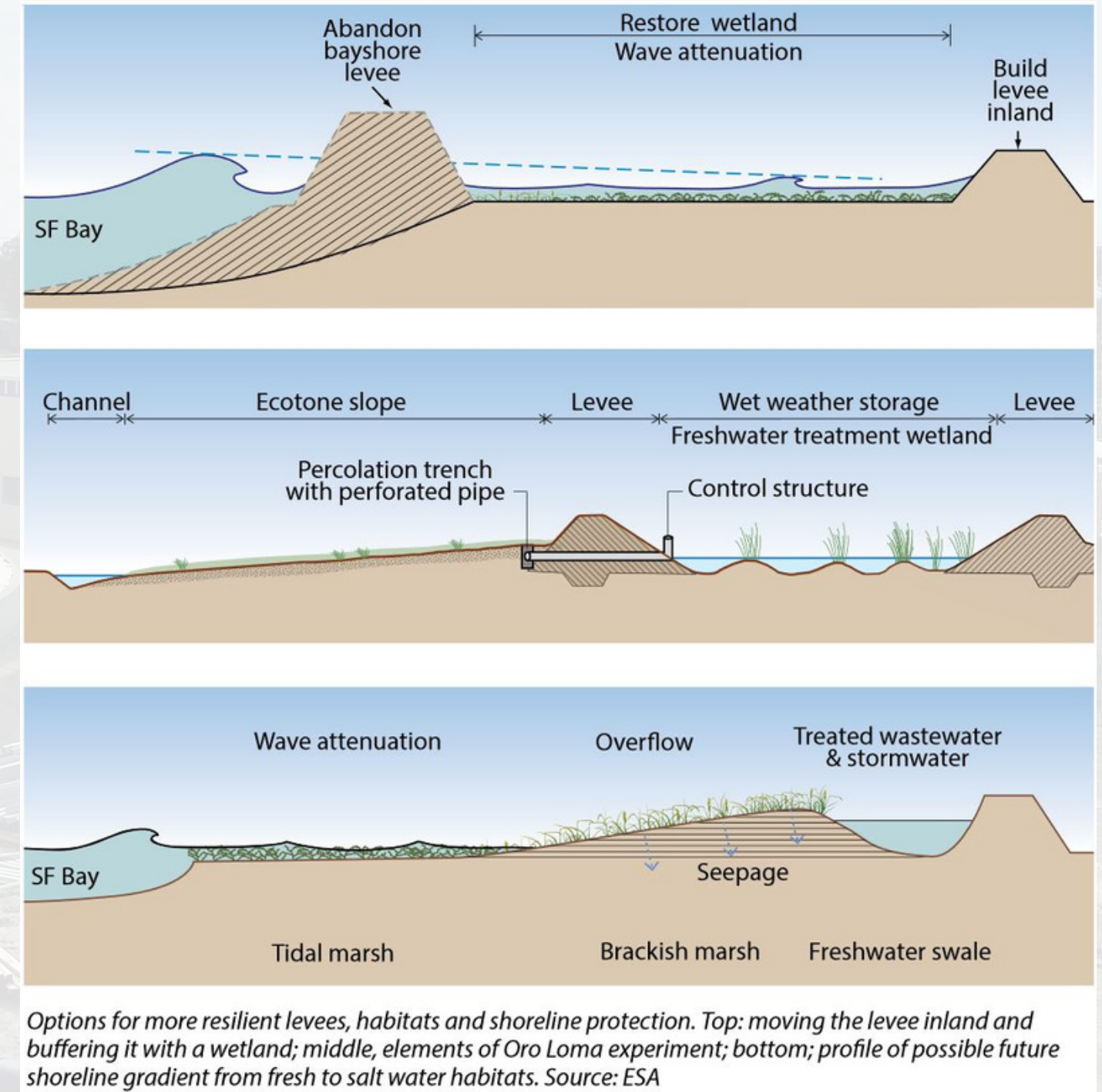
The experiment is divided into 12 beds and will test four different combinations of soil types, plant species and watering regimes, as well as provide three replicates. Source: ESA



2021 and Beyond

The project site is being meticulously monitored over the next three years by researchers from the University of California, Berkeley as part of the NSF ReNUWIt Engineering Research Center.

Project managers hope that the Castro Valley/Oro Loma ecotone slope will serve as a replicable model in the future and that the effluent from the ecotone slope will turn out to be so highly purified that any future slopes could be connected with, and seep into, outlying marshes and the Bay.





Win Win Win



- Water Quality and Bay Health
- Flood Protection
- Wildlife Habitat



For more information:
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