The Levee Project

The Levee Project is a collaborative educational project between CSU Stanislaus, Merced College, and Delta College. Its goal is to have students from the different institutions meet, work collaborative in the data acquisition, and develop interest in graduating from college with a STEM degree. Our “graduates” have used the data to prepare posters (AEG, GSA, WRPI, COAST, NASA, and JPL) and to apply for graduate school. Besides, there is nothing like a sunny day in the estuary!
WHY ARE LEVEES IMPORTANT?

• PROTECT LIFE AND PROPERTY

• HELPED CLEAR THE SEDIMENT-CHOKED CHANNELS AFTER THE GOLD RUSH

• CAUSE THE UPPER ESTUARY TO BE HIGHLY TRANSMISSIVE OF PEAK FLOWS (AND NOW OF WATER RELEASED FROM THE NORTHERN DAMS)
OVERVIEW OF THE LEVEE SYSTEM

• 1000+ MILES OF LEVEE SYSTEM

• BUILT OVER A PERIOD OF 150 YEARS (SOME ARE ELDERLY & VULNERABLE)

• SUPPORTS LOCAL AGRICULTURE

• PROVIDES DRINKING WATER TO 23 MILLION CALIFORNIANS
OUR RESEARCH

• LOCATE PROBLEM AREAS TO AVOID BREECH OF LEVEES

• GEOPHYSICAL SURVEYS
  • COST EFFECTIVE
  • NON-INVASIVE
  • SHEAR WAVE VELOCITY SURVEYS
  • CAPACITIVELY-COUPLED RESISTIVITY (CCR) SURVEYS
  • IDENTIFY SUSURFACE MATERIALS TO PINPOINT PROBLEM AREAS

• VISIT OUR POSTER FOR MORE!

**Delta levee construction**

Most of the Delta's 100-year-old levees are made of the loose sand and peat soil that was dredged to deepen or create sloughs and channels. The resulting below-sea-level islands have been mainly used for farming and ranching.

Levees fail because of:

1. **Erosion** from channel flows, tidal action, wind-generated waves and boat wakes.

2. **Seepage** aided by burrowing rodents, decaying tree roots, old buried pipes, settlement, levees that are too narrow.

3. **Sinking islands**
   - Crown: Most of the old levees are less than 10 feet tall.
   - Repairs are usually made by dumping more soil and rocks on the top.
   - Sinking islands: Ground level has dropped as much as 20 feet. The lower the ground, the more water pressure pushes against the levee.

Source: California Department of Water Resources
SAN JOAQUIN RIVER AT JERSEY POINT

Typical Net Flow Patterns with Export Pumping

- Net flow is downstream
- Net flow is upstream

Harvey Banks Pumping Plant
(State of California)

Tracy Pumping Plant
(United States Federal)