

FLOOD CONTROL

WALNUT CREEK

(Tidal reach from the mouth to Highway 4)

Key Issue Statement

Lower Walnut Creek provides flood protection for approximately a 40-year storm and ongoing sedimentation and sea level rise will further reduce flood capacity, which could cause more frequent and extensive flooding of roads and railroads around the Tesoro Refinery. CCCFC&WCD is conducting public outreach and studies to inform the restoration of Lower Walnut Creek and develop alternatives that provide multiple benefits.

Asset Description

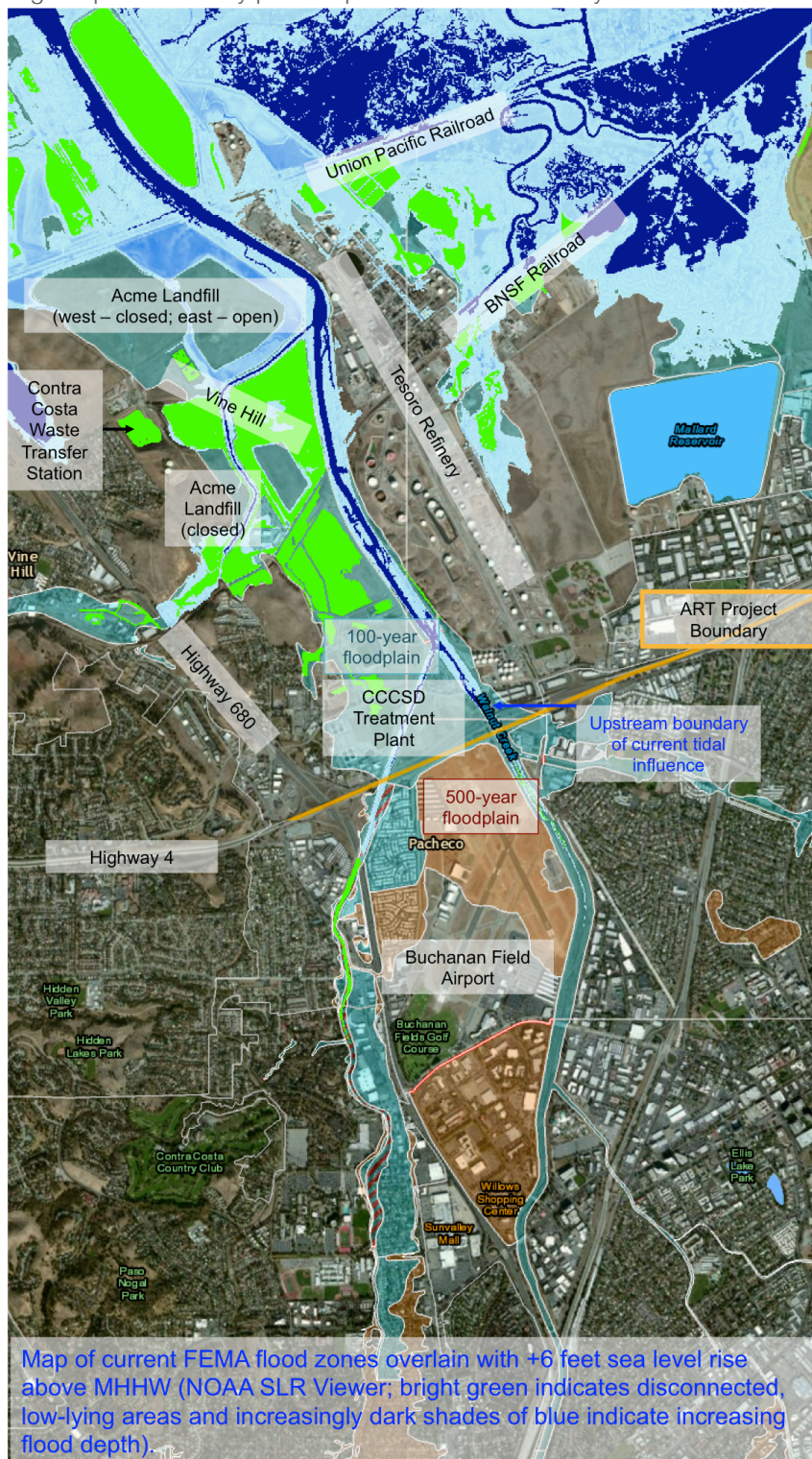
Walnut Creek is the largest watershed in Contra Costa County, draining over 150 square miles and containing eight cities and over 300,000 residents. Starting in 1963, the U.S. Army Corps of Engineers (USACE) constructed about 22 miles of channel improvements consisting of channel enlargement, channel stabilization, and levees along Lower Walnut Creek and its tributaries to provide 100-year flood protection. The existing project is a classic trapezoidal earthen channel with levees on one or both banks, which has historically needed de-silting to maintain the design capacity. For example, in 1973 just 10 years after the project was constructed, USACE dredged over 850,000 cubic yards of sand and mud from the lower channel. As the local sponsor, the Contra Costa County Flood Control and Water Conservation District (CCCFC&WCD) owns and maintains the channel as part of Flood Control Zone 3B, receiving only 75% of necessary maintenance funding due to restrictions associated with Propositions 13 and 218. Very high tides typically overtop the channel levees along the west side of lowermost Walnut Creek and flood Waterfront Road (parallel to Union Pacific Railroad, UPRR), blocking traffic into and out of the Tesoro Refinery. The west side of the creek between UPRR and BNSF also has drainage issues.

CCCFC&WCD is working on the innovative Lower Walnut Creek Restoration Project to reduce current flood risk, accommodate sea level rise, manage sediment, improve wildlife habitat, and provide more recreation opportunities. While Lower Walnut Creek was designed to provide 100-year flood protection, the current level of protection is approximately a 40-year storm due to increased development in the watershed and channel sedimentation. CCCFC&WCD requested from Congress that the lowermost four miles of the USACE Walnut Creek Project be deauthorized so that it is no longer subject to USACE standards. When CCCFC&WCD prepared to dredge the channel in the early 1990s, significant wildlife habitat had developed in the channel and dredging would have involved removing all the vegetation (and habitat) to restore the channel to the 1960s configuration. CCCFC&WCD believed that the channel had reached an equilibrium *including* this habitat and that it would take decades to reestablish the vegetation if it was removed. From 2004 through 2012, CCCFC&WCD worked closely with the USACE to reevaluate the operation of the channel and design a more sustainable project, but lack of consistent federal funding hindered progress. Now that the creek is deauthorized and exclusively under local control, CCCFC&WCD has developed a vision for Lower Walnut Creek and hired consultants to conduct public outreach, feasibility studies, and conceptual designs for the restoration. Walnut Creek is also one of three creeks in the Bay being studied as part of Flood Control 2.0, an effort to redesign flood control channels so that they provide both future flood conveyance and ecological benefits under climate change.

Just upstream of the Lower Walnut Creek Restoration Project, CCCFC&WCD is working with Central Contra Costa Sanitary District (CCCSD) to rehabilitate the levees protecting the Wastewater Treatment Plant just north of Highway 4. The levees protecting the plant currently provide protection from a 100-year storm but lack freeboard. CCCFC&WCD and CCCSD are sharing the cost to increase flood protection to a 500-year storm with freeboard, taking sea level rise into account, because the facility is extremely sensitive to flood damage. Project completion is anticipated by the end of 2018.

Exposure to Flooding

Sea level rise will exacerbate coastal and riverine flooding in Lower Walnut Creek. Tidal influence currently extends approximately 3.5 miles from the mouth to the CCCSD Treatment Plant pipe crossing near Highway 4 and sea level rise will cause the tides to extend further ('migrate') upstream and raise water levels in the creek. This will progressively reduce the capacity of the creek to discharge flood flows, such that smaller, more frequent storms will cause overbank flooding and stormwater backups, particularly in low-lying areas that will no longer be able to effectively gravity drain against the higher downstream tidal condition. While overlaying FEMA Flood Insurance Rate Maps (FIRMs) and sea level rise inundation maps suggests the risk of joint coastal-riverine flooding, analysis is needed to better understand the extent of flooding caused by combinations of Bay water levels, sea level rise, and flood flows and CCCFC&WCD is conducting this analysis through the Lower Walnut Creek Restoration Project.



Vulnerabilities

INFO: FEMA FIRMs do not factor in sea level rise, which make it difficult for flood managers and communities to prepare for future flooding. Results of CCCFC&WCD's joint coastal-riverine flood modeling will quantify how sea level rise will worsen conditions in existing floodplains and bring new areas into floodplains.

GOV: At present, there is no framework for planning and permitting innovative, multi-benefit flood protection projects. Each agency is constrained by its mandate and regulations, resulting in generally static and fragmented decision-making, passive management, and an emphasis on historic preservation despite the fact that climate change is expected to lead to unforeseen and potentially detrimental impacts.

PHYS: Land adjacent to Lower Walnut Creek is in the 100-year floodplain and increased tidal action due to sea level rise will reduce the capacity to discharge flood flows, particularly when rainfall events coincide with high tide.

Consequences

Society and Equity: While there are no communities or parks along Lower Walnut Creek, there would be consequences to society and equity if Tesoro Golden Eagle Refinery, Central Contra Costa Sanitary District (CCCSD) Treatment Plant, and landfill/waste facilities (Acme Landfill, Vine Hill Complex, and Contra Costa Waste Transfer Station) were flooded. Disruption of refinery operations could impact local and regional jobs both on site and in the sectors serving the refinery. The CCCSD Treatment Plant is extremely sensitive to flood damage and if storm events and sea level rise shut down the treatment plant, even temporarily, untreated wastewater could back up into homes, businesses, and neighborhoods and spread disease. Furthermore, mobilization of contaminants on landfill/waste facilities poses a risk to public health.

Environment: Increased flooding in Lower Walnut Creek could also mobilize hazardous substances from adjacent industrial sites, landfill/waste facilities, and the treatment plant and decrease water quality in the creek, adjacent marshes (Bullhead Marsh, Pt. Edith Marsh, Pacheco Marsh), and the Bay. The Walnut Creek Watershed supports a variety of species, including federally threatened Coho salmon, federally threatened steelhead trout, black rails (threatened), and California Ridgway's rails (endangered).

Economy: If Lower Walnut Creek cannot provide adequate flood protection, disruptions to local roads, damage to energy services, shutdown of the one treatment plant serving 467,500 residents and 3,000 businesses in the area, and lack of railroad service could affect the regional economy. With or without the Lower Walnut Creek Restoration Project, increasing tides will make flooding of Waterfront Road worse and limit access to the north end of the Tesoro Refinery.