

FLOOD CONTROL

RODEO CREEK**(Tidal reach from the mouth to 3rd St.)****Key Issue Statement**

Lower Rodeo Creek provides flood protection for approximately a 15 to 20-year storm and ongoing sedimentation and sea level rise will further reduce flood capacity, which could cause more frequent and extensive flooding of low-income single and multiple-family residential units and struggling businesses located in downtown Rodeo. CCCFC&WCD does not have a funding mechanism for flood protection improvements, which would need to be consistent with USACE standards since Lower Rodeo Creek is a federal facility. It is critical that planners work with flood managers to better understand the vulnerability of downtown communities and businesses to combined tidal-riverine flooding using watershed-scale hydraulic models and communicate this information to stakeholders interested in developing projects that improve resilience to sea level rise and provide multiple benefits.

Asset Description

Rodeo Creek drains approximately 10 square miles of mostly open space and agricultural lands in the upper watershed and the community of Rodeo in the lower watershed. In 1960s, the U.S. Army Corps of Engineers (USACE) constructed a flood control project from the mouth to I-80 to provide 100-year flood protection, where the lowermost 0.3 miles from the Bay to 3rd Street is a rectangular concrete channel with limited right-of-way and the 0.8 miles upstream is a trapezoidal earthen 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 Zones 8 and 8A.

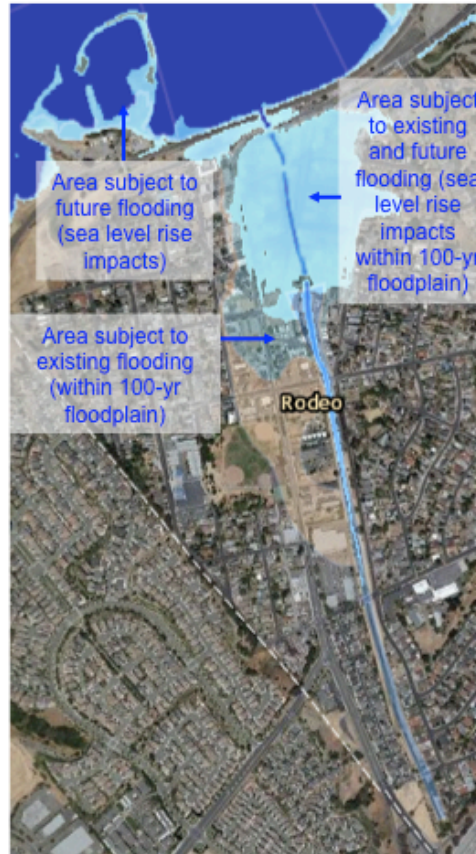
Sediment accumulates in the tidal reach of Rodeo Creek because of conditions created by the original USACE design. CCCFC&WCD receives only 5% of the funding necessary to perform channel maintenance such as desilting due to funding restrictions associated with Propositions 13 and 218. Since desilting is both expensive and difficult to permit, the last sediment removal effort was in mid-1990s. As a result of this sedimentation, the channel now only conveys approximately the 15 to 20-year riverine flow. The 2005/2006 New Year's Eve storm events almost caused overbank flooding.

Exposure to Flooding

Sea level rise will exacerbate riverine flooding. Tidal influence currently extends from the mouth to 3rd Street 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 creeks 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. Analysis conducted by CCCFC&WCD to evaluate the impacts of the City of Hercules proposed sports park near the Conoco-Phillips Coke Plant off of Highway 4 (plans have since been abandoned) showed that construction of detention basins in the upper watershed would provide some storage capacity, but that the effect would be limited to minor storm events, and the 100-year riverine flow would still overtop the creek in downtown Rodeo.

Current coastal & riverine flood risk

**Future coastal & riverine flood risk
(Current conditions + Sea level rise)**



Map current FEMA flood zones (left) overlain with +6 feet sea level rise above MHHW (right; NOAA SLR Viewer, where increasingly dark shades of blue indicate increasing flood depth).

I-80

Further modeling is needed to evaluate the combinations of Bay water levels, sea level rise, and flood flows that cause flooding and inform community planning processes that aim to refine a watershed vision where the creek provides a range of benefits, included but not limited to flood protection. While overlaying FEMA Flood Insurance Rate Maps (FIRMs) and sea level rise inundation maps suggests the risk of joint coastal-riverine flooding, it may underestimate the potential for an increase in flood risk in the current 100-year floodplain due to sea level rises. Furthermore, simply overlaying FEMA FIRMs and sea level rise inundation maps may overlook areas at risk from joint coastal-riverine flooding.

Vulnerabilities

INFO: While FEMA FIRMs are believed to be generally accurate for Rodeo Creek, the maps do not factor in sea level rise and therefore do not illustrate the community’s future increased flood risk. Furthermore, FEMA FIRMs show the overlay of the 100-year riverine and coastal floodplains, whereby the 100-year riverine flow sets the upstream and the 100-year tidal condition sets the downstream flood extent. The joint probability of riverine and coastal events likely increases the elevation and extent of the 100-year floodplain, but FEMA FIRMs depict riverine and coastal flooding as independent events and use the higher of the two flood elevations where riverine and coastal floodplains overlap.

GOV1: CCCFC&WCD does not have adequate maintenance funding to preserve what limited flood capacity exists nor funding to plan and implement improvements to increase the level of flood protection.

GOV2: Since Rodeo Creek is a federal facility, improvements must be consistent with USACE policy to remain eligible for federal disaster relief. This limits CCCFC&WCD's options for sediment management because the original design promoted deposition, and even with increased tidal prism associated with sea level rise, there will not likely be sufficient volumetric exchange to naturally scour the channel.

PHYS: Downtown Rodeo is already in the 100-year FEMA floodplain and increased tidal action due to sea level rise will reduce the capacity of Rodeo Creek to discharge flood flows, particularly when rainfall events coincide with high tide.

Consequences

Society and Equity: If downtown Rodeo Creek flooding becomes more frequent and extreme, community members could suffer damages to homes and businesses.

Environment: Since there is little to no habitat in the rectangular concrete channel that characterizes lower Rodeo Creek, there are minimal flooding consequences to species.

Economy: If Rodeo Creek cannot provide adequate flood protection, damage to local residences and businesses could affect the local economy and disruptions to railroad service could affect the regional economy.