

An urban geomorphic assessment of the Berryessa Creek and Upper Penitencia Creek watersheds in San José, CA.

Brett Jordan

Department of Civil Engineering, Colorado State University, Fort Collins Colorado, 80523-1372;
bjordan@engr.colostate.edu

C.C. Watson

Department of Civil Engineering, Colorado State University, Fort Collins Colorado, 80523-1372

W.K. Annable

Department of Civil Engineering, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1;
wkannabl@uwaterloo.ca

D. Sen

Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, California, 95118-3686;
Dsen@valleywater.org

Abstract. Berryessa Creek, located on the east side of San Jose, California, has experienced significant channel instability and sedimentation problems in recent years. Historically, as late as the early 1900s, the channel drained from the Diablo mountain range and terminated in an alluvial fan upon reaching the Santa Clara Valley. By 1943, the marshy area in the vicinity of the alluvial fan was drained for residential growth and agriculture, and a channel was created on the valley floor.

As urbanization proceeded in the San Jose area, the channel has undergone a series of realignments and channelization practices, resulting in an aggrading man-made canal at the downstream end of the watershed and severe erosion problems in the middle reaches. Conversely, an adjacent watershed, Upper Penitencia Creek, having a similar watershed area, land use, geology and relief has undergone comparable urbanization over the same time period but has maintained a stable channel planform and outlet condition since the early 1900s. This study will examine the comparative geomorphic process occurring in these two urban watersheds using morphometric analysis, time trend urbanization analysis, storm sewer network characterization, and field surveys including longitudinal profiles, cross-section erosion surveys and sedimentological analysis. The goal of this research is to gain understanding of the processes governing channel stability and instability given two adjacent watersheds with vastly differing morphological responses to urbanization and to initiate a data base forum for urban creeks in the Santa Clara Valley region of California.