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Stream Gaging and Sediment Transport

Thompson Creek Sediment and Channel Incision Study, San Jose, California

Erosion at bridge abutment

Assessment Components:

- Paired stations upstream and downstream of urbanized portions of the watershed.
- High-flow measurements of flow and sediment to develop sediment-rating curves
- Calculations of flow frequency and sediment work analysis to identify flow ranges that cause the most erosion

High sediment load at moderate flow level

Background

Thompson Creek is located in a rapidly developing southeastern of San Jose. Hydromodification (higher and more frequent flow peaks) associated with urbanization is causing significant bank and bed erosion in Thompson Creek and its tributaries. The erosion is threatening infrastructure, destabilizing riparian vegetation, and increasing the need for downstream dredging. Balance Hydrologics worked with the Santa Clara Valley Water District to install 3 sets of paired flow and sediment monitoring stations upstream and downstream of urbanized portions of the watershed. Flow and sediment totals were calculated to quantify the impact of suburban land uses.

Undercutting below root zone at moderate flow levels

Project Team Accomplishments:

- Quantifying differential sediment yields in urbanized open-space reaches.
- Identifying the most destructive flows as high-frequency, moderate-flow levels that result from small amounts of rainfall paired with well-connected impervious flow paths.