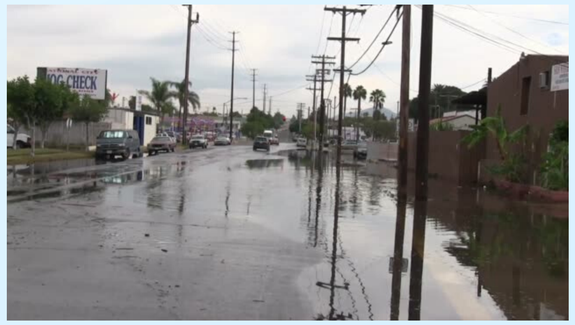
Paradise Creek Flood Mitigation

Overview



Our purpose was to assess a series of alternative designs aimed at reducing the impact of seasonal flooding along Paradise Creek in National City, CA. To do this, we created a 1-D model in HEC-RAS to map the flooding under the current conditions, then we modified the geometry to simulate the different alternatives we were evaluating. The alternatives that we analyzed involved two types of barriers installed at the downstream entrance to the I-5 culvert, a levee along the creek, and a diversionary wetland area to absorb additional flow.

Meet the Team:

Left to Right-
HEC-RAS Lead: Marina Balcazar
Project Manager: Ehrick Costello
Environmental: Michelle Melkonians
Hydrology: Julia Moore
AutoCAD Lead: Sophia Jorge (not shown)

Alternatives

Wetland/Levee

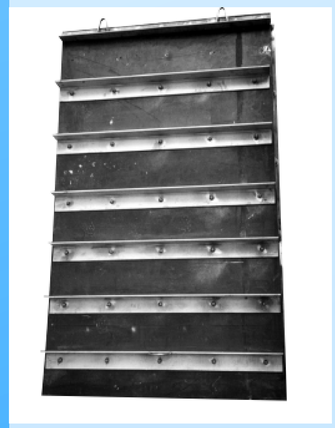
A floodwall along the banks of Paradise Creek may eliminate flooding in the Area of Interest, but may also increase flooding upstream.

Inflatable Dam

Inflatable dams can be installed at the mouth of a creek and inflated or deflated on short notice. Our initial proposal included only dams installed at the I-5 culverts, but we later evaluated an additional location further downstream.

Source: inflatabledam.com

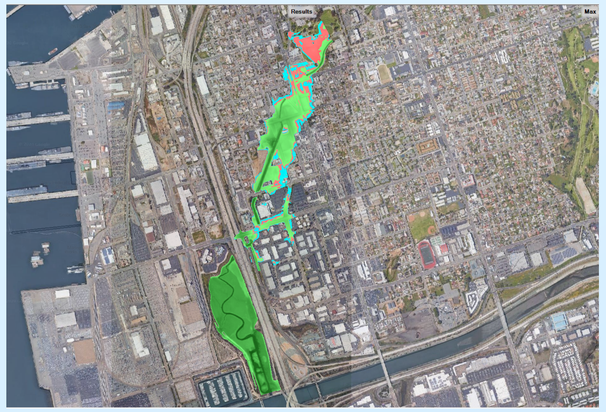
Flap gate



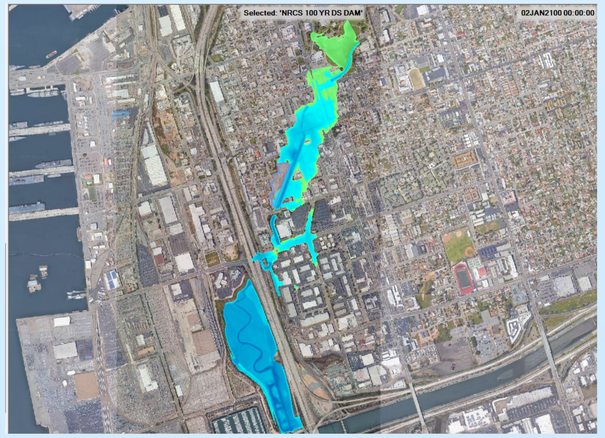
www.hydrogate.com

Flap gates can be installed at the entrance to culverts to prevent backflow. They have an equalizing effect, so the water level on either side of the gate will be roughly the same, with some differences due to head loss through the gate. In this case, a flap gate would prevent tidal intrusion to Paradise Creek, increasing the base capacity of the creek, but still allowing water to back up to the level of the King Tide.

HEC-RAS Model



Flooding extent when design storms interact with a King Tide.



Flood reduction during a 100 Year Storm with dam installed at the mouth of the Sweetwater River

A Special Thanks To:

Dr. Christy Dykstra and Julio Garcia

Spring 2020