

Fires, Floods, and Destruction: Effects of Developing in the Pomona Valley Floodplain

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Abstract

Considering ecological functions, geography, city planning and infrastructure, and cultural values, we situate the devastating Southern California 1938 flood in context with similar instances. We then analyze the implications today for floods and flood control infrastructure to promote awareness of future flood risks in the region.

Research Question

What are the factors that led to the California 1938 flood, what actions were taken in the wake of the damage, and what can be done today?

Background (San Bernardino and San Gabriel Mountains)

Erosion & Flooding Risks

- Steepest Peak over 11,000 ft
- Dry material slides down slopes
- Vegetation loss
- Fire-flood sequence

Living in a Floodplain

- Foothill communities from Fontana to Pasadena
- Flood control infrastructure was unprepared

Forgotten History

- 43-day storm in 1861 put parts of CA underwater for up to six months
- 1961 - 1962 flood ravaged much of the American West
- Natives tried to warn settlers & left
- Geological evidence of megafloods every 100-200 yrs

Methods

We analyzed documents on CA floods, the San Antonio dam, and water retention. Sources from Special Collections include a 1965 CGU Thesis on Fire/Flood sequences, "The Story of the San Antonio Dam," and pictures from the flood. Other sources include government documents, websites, & private organizations.



Figure 1. Debris cones blocking a road in the San Dimas Experimental Forest. Photographed several days after the 1960 Johnstone Peak Fire(Fire-Flood Sequence in the San abriel Mountains of Southern California 1965)



Figure 2. Aftermath of the 1938 flood from San Antonio Canyon,looking southwest towards Claremont (Loyd 1938).

Findings and Conclusions



Figure 3. Image of road destruction from the 1938 Flood 8th St. and Amherst (Special Collections 1938)

- The 2-3 feet of rain led to 87 deaths and \$1.3 billion in structural damages (Duffy 1956).
- Overwhelmed existing check dams, channels, and levees built by the Los Angeles County Flood District (Masters 2017, Duffy 1956).

- Federal funding and the Army Corps of Engineers built the San Antonio Canyon Dam as an immediate response (Duffy 1956).
- It is an Embankment Dam built with the sole purpose of flood and debris control
- Empty during the dry seasons with flow through into the channel permitted ("Dam Safety" 2012).



Figures 4a & 4b. The San Anotnio County Dam (a) and Channel (b) current day (Croce 2018)

- The water flows through into the Santa Ana River and eventually Prado Reservoir.
- Dam is almost 70 years old and needs constant maintenance to prevent failure (Escriva 2018, "Dam Safety" 2012).



Figure 5a & 5b. Permeable concrete & asphalt that collect storm runoff water (Selbig 2018).

- Local groups such as the Pomona Valley Protective Association work with flood control agencies and water masters to create sustained groundwater levels
 - Capturing water into aquifers
 - Use permeable surfaces & gravel pits
- Current flood control infrastructure does little to store rainwater... this could alleviate dependence on imported water

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