The 2017 Coyote Creek Flood at the Intersection of Homelessness and Flood Risk Management

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Abstract

The issue of homelessness is an understudied topic in flood risk management. The challenge is twofold: homeless communities living on riverbanks and floodplains are particularly vulnerable to flood disasters, and their presence weakens flood protection structures. In this study, we analyze the 2017 Coyote Creek flood in San Jose, California to understand what happened during this flood event, how the homeless community was impacted, and how local agencies dealt with these two challenges. Drawing from lessons from other regions, we highlight the need to propose a holistic framework to include the issue of homelessness in flood risk management in San Jose, which could be transferable to other regions.

Key words: Environmental justice, homelessness, flood risk management, 2017 Coyote Creek Flood

1. Introduction

The issue of homelessness remains significantly underrepresented in news reports and policy measures related to flood disasters, aftermath, and risk management. California has the highest homeless population in the nation (181,399 unhoused Californians), with limited regional policies addressing their safety, experiences, movement, and resources (Fact sheet: Homelessness in California, 2024). In San Jose, the homeless population increased from 4,350 in 2017 to over 6,500 in 2023, with 70% unsheltered and more than half living in districts intersecting Coyote Creek, establishing encampments in flood-prone areas. (2023 Homeless Census - Executive Summary, 2023). Efforts to dismantle encampments, such as a homeless encampment known as "the Jungle"with 300 inhabitants in 2014, are rarely successful, and homeless people often return to the same locations (top two red circled regions highlighted in the map Figure 3, where "the Jungle" was), as indicated by the trash collection service map (C. Ratana, personal

communication, February 28, 2014; Fernandez & Miranda, 2014).

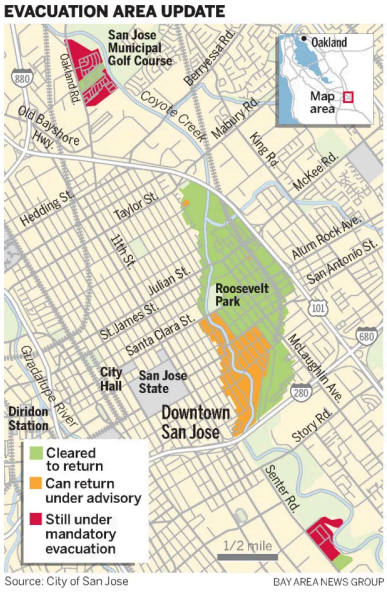

FIGURE 1. "The Jungle" Homeless Encampment (Left)
FIGURE 2. Mandatory Evacuation Areas during 2017 Flood. (Right)

Study area

Coyote Creek in Milpitas, California, flows north through Coyote Valley, covering a watershed of about 320 square miles and extending 63.6 miles (USGS, 1981). It reaches Coyote Reservoir and Anderson Lake at the Diablo Range, with the Coyote Reservoir Dam storing 10,000 acre-feet of water (Reservoirs, 2017). On February 20-21, 2017, intense rainfall caused Anderson Reservoir to exceed capacity, leading to significant overflow into Coyote Creek, flooding San Jose neighborhoods along US Highway 101 (Pero, 2017). This 20-year flood displaced about 14,000 people and caused an estimated $100 million in damages (Martin, 2019). San Jose officials acknowledged failures in the absence of an emergency director and evacuation warnings, and current flood protection plans by the Santa Clara Valley Water District include temporary embankments, floodwalls, and improvements along nine miles of Coyote Creek, designed for a 20-year flood (E1: CC Flood Protection, 2024).

2. Hypothesis and Methods

Our research looks at the challenges related to homeless camps and flood risk management in San Jose, California, posing these questions:

- Where are homeless camps located in flood hazard zones?
- How were they impacted by the 2017 Coyote Creek flood?
- How did the authorities manage homeless camps during and after the event?
- How are other organizations dealing with homelessness in relation to flood risk and what can we learn from them?

Our main goal is to propose a more holistic framework to deal with the challenges associated with homelessness in flood risk management.

To answer these questions, we have analyzed: (1) gray literature (local agency reports & literature related to flood risk and homelessness, and newspapers) in relation to the 2017 Coyote Creek Flood; (2) best practices in Riverside County and the city of Azusa in California, as well as a tale of caution in Portland, Oregon; and (3) interviews with Chris Ratana – a San Mateo Human Services Analyst, Will Denecke – the founder of the non-profit Clean Camp PDX in Portland, and Jaeho Hahn – assistant engineer at Valley Water. Interviews with each party focused on the homeless population in San Jose, city-level homeless policy, and flood risk mapping respectively to better understand the role of different agencies in mitigating flood disaster impacts at this intersection.

3. Results and Discussion

3.1. Where are homeless camps located in flood hazard zones?

Despite the heightened risk homeless communities face during storm events due to their proximity to rivers, lack of access to information, and inadequate storm shelters, minimal data on the impact of flooding on this population is available. To address this gap, we created an overlay map identifying concentrations of homeless people experiencing elevated flood risk along Coyote Creek north of Yerba Buena Road in San Jose. The map overlays flood hazard zones, trash collection and waterway services near homeless encampments, and vulnerable communities identified by the National Risk Index. The 2017 flood impacted the regulatory floodway, 100-year floodplain, and some areas with reduced risk due to levee.

Using the BeautifySJ trash services map (City of San Jose, 2024) and information related to homeless trash production shared by C. Ratana, we have determined that the employment of these services are indicative of a consistently large production of trash, which typically correlates to a concentration of homeless people in a particular region and can reasonably correspond to the establishment of an active encampment (Personal Communication, May 23, 2024). The intersection of flood hazard zones, homeless trash pickup services, relatively high to high NRI, and areas that were not evacuated are circled in red. There are significant areas along Coyote Creek under severe flood risks

where many homeless encampments are located, but were not given evacuation notice of safety during the flood event in 2017.

3.2. How was the homeless population impacted by the 2017 Coyote Creek flood?

During the 2017 Coyote Creek flood many of the affected homeless individuals were living in encampments along the creek, which were inundated with floodwaters, forcing them to evacuate abruptly (Martin, 2019). The flood destroyed personal belongings, including tents, clothing, and identification documents, further destabilizing their already precarious living situations (Kurhi, 2017). Emergency shelters were quickly overwhelmed, and the city's response highlighted significant gaps in preparedness and resources for homeless individuals during natural disasters (Trujillo, 2017). News reports primarily focused on the state and recovery of San Jose residents with permanent addresses, often neglecting the

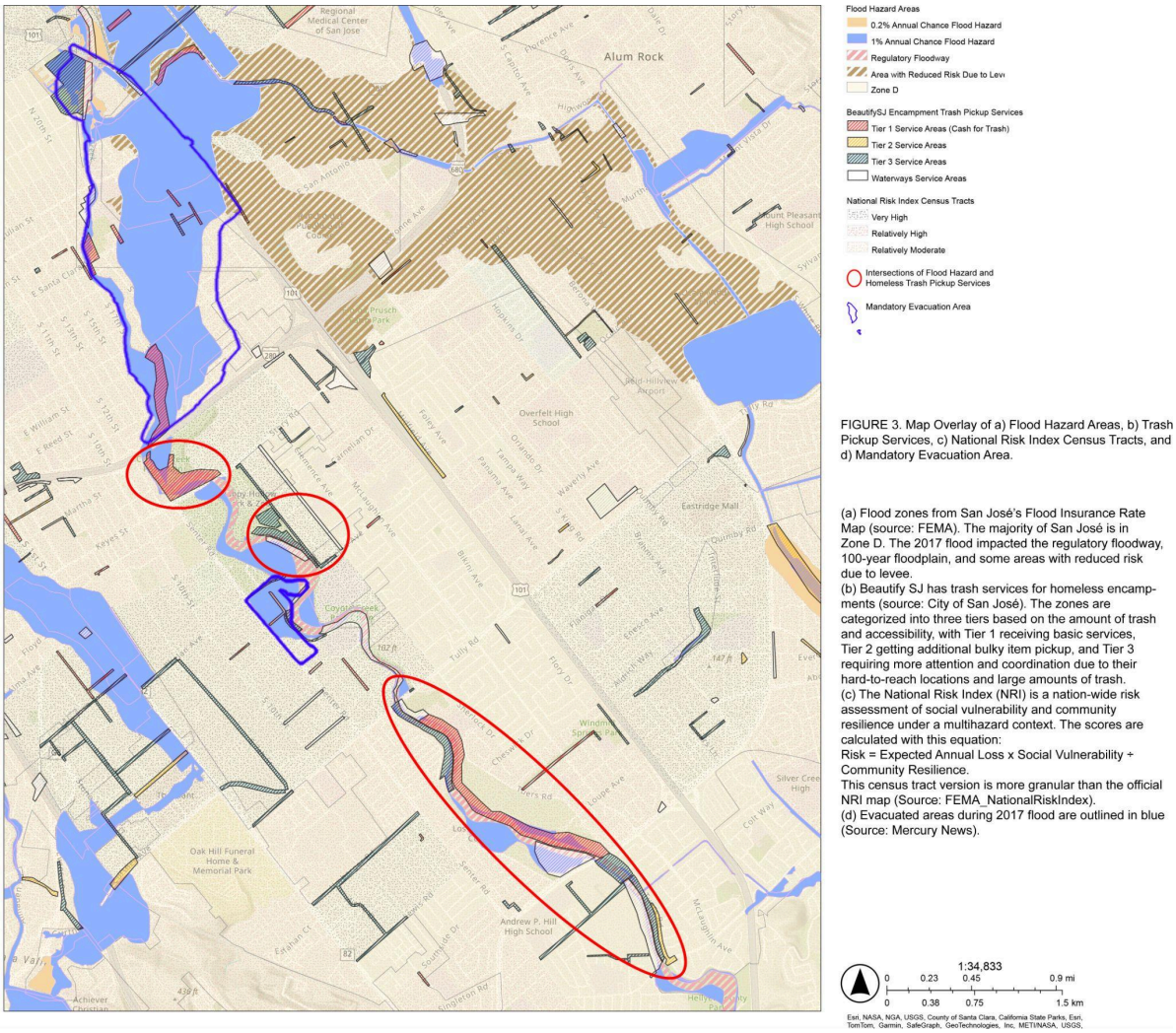

FIGURE 3. Map Overlay of a) Flood Hazard Areas, b) Trash Pickup Services, c) National Risk Index Census Tracts, and d) Mandatory Evacuation Area.

(a) Flood zones from San José's Flood Insurance Rate Map (source: FEMA). The majority of San José is in Zone D. The 2017 flood impacted the regulatory floodway, 100-year floodplain, and some areas with reduced risk due to levee.
(b) Beautify SJ has trash services for homeless encampments (source: City of San José). The zones are categorized into three tiers based on the amount of trash and accessibility, with Tier 1 receiving basic services, Tier 2 getting additional bulky item pickup, and Tier 3 requiring more attention and coordination due to their hard-to-reach locations and large amounts of trash.
(c) The National Risk Index (NRI) is a nation-wide risk assessment of social vulnerability and community resilience under a multihazard context. The scores are calculated with this equation:
Risk = Expected Annual Loss x Social Vulnerability ÷ Community Resilience.
This census tract version is more granular than the official NRI map (Source: FEMA_NationalRiskIndex).
(d) Evacuated areas during 2017 flood are outlined in blue (Source: Mercury News).

plight of the homeless. Despite the displacement plainly exacerbating existing challenges, such as access to medical care and social services, minimal news coverage and data methodologies were employed to track the impact and recovery of the impacted homeless population (Trujillo, 2017). The flood disaster underscored the immediate physical dangers faced by the homeless during such events and highlighted the systematic disenfranchisement of the homeless population, evident in the discrepancies in available data to track the impacts on their communities.

3.3. How did the authorities manage homeless camps during and after the 2017 flood?

During and after the 2017 Coyote Creek flood, flood risk and social welfare agencies faced significant challenges in managing homeless camps. Initially, the sudden inundation forced many homeless individuals to evacuate without adequate notice or preparation, leading to chaotic and dangerous conditions (Martin, 2019). Emergency services and social welfare agencies' response was hampered by a lack of resources and preparedness specifically for the homeless population. Temporary shelters were established, but they quickly became overcrowded, highlighting the limited capacity to handle such crises (Trujillo, 2017). Social welfare authorities attempted to provide basic necessities, such as food, clothing, and medical care, however, access to these resources by displaced individuals during natural disasters can be significantly barred due to bureaucratic hurdles and transportation issues (SAMHSA, 2017). In the aftermath, authorities worked to assess the damage and provide more resources to the homeless community during natural disasters by allocating $3,611,870 to "unhoused services, support, outreach and limited duration housing options" in 2023 (Kadah, 2023). The flood also prompted a reevaluation of disaster preparedness plans, emphasizing the need for better data collection and coordination to address the needs of homeless individuals more effectively (E1: CC Flood Protection, 2024).

3.4. How do other organizations deal with homelessness in relation to flood risk and what can we learn from them?

To improve current approaches, we have looked at three examples of good practices and one unsatisfactory case study.

3.4.1. Example 1: 7 principles for working with homeless people from the United States Interagency Council on Homelessness

The US Interagency Council on Homelessness (USICH) created a framework of 7 principles for working with homeless people (Schneider, 2023). These principles serve as a holistic guide that apply to flood mitigation and rehabilitation projects, emphasizing the establishment of interagency relationships and trust from homeless communities. In the context of emergency responses, these principles include: **Principle 1**: Establish closer ties between the US Department of Housing & Urban Development (HUD), shelters, social services, mental health services, FEMA, emergency management offices, and in the case of San Jose, Valley Water; **Principle 2**: Educate homeless people of risks of living in a flood-prone area, learn the camps' preferred way of communication, and establish trust; **Principle 3**: Establish trust worthy relationships with campers, mapping homeless hotspots with accurate flood risk knowledge; **Principle 4**: Provide basic needs and storage for people's important documents so they don't get destroyed/lost in the flood; **Principle 5**: Ensure access to shelter for emergencies; **Principle 6**: Connect people who have been evacuated with pathways to permanent housing and support. This is not only a matter of presenting people with resources; **Principle 7**: For the social services sector, understand why people come back to high-risk places and avoid shelters (e.g. excessive rules, bad living conditions, crowdedness, etc.), and demand the city to use homelessness reduction funds to create legal low-risk alternatives for camping.

3.4.2. Example 2. Homeless Relocation for Levee Rehabilitation in Riverside, California

Riverside County Flood Control effectively engaged with homeless populations living on levees prior to a $36 million rehabilitation project. By partnering with 42 agencies, incorporating community feedback, providing extended evacuation notices, communicating in-person and with signages, and hosting on-site resource fairs, they were able to relocate 200-300 people along 13,000 feet of levee and 7,500 feet of diversion channel. The trash removal cost $300K (Adams & Santos, 2023).

3.4.3. Example 3. Homeless Evacuation before Hurricane Hillary in Azusa, California

One good example of properly evacuating homeless communities merely days before flood emergencies is the relocation of 65 homeless people living in riverbeds downstream of Santa Fe Dam

before Hurricane Hillary in August 2023. An orchestrated effort by local police, sheriff's homeless outreach team, U.S. Army Corps of Engineers, and the LA Homeless Services Authority successfully moved the at-risk individuals to shelters. The evacuation covered more than 40 miles, with inspections near the dam, spillways, and along several rivers. The keys to their success were recognizing the limited reach of emergency alerts, liaising with community resources, recruiting mental health experts, and prioritizing life-saving measures over punishment (Dena, 2023).

3.4.4. Example 4: Illegalization and Abatement of Encampments in Portland, Oregan

In Portland, Oregon, about half of the 6,297 homeless individuals remain on the streets due to shelter shortages (Theriault, Denis, et al., 2023). While volunteer groups provide alerts during extreme weather events, the city struggles to address flooding and storm risks. Underspending of homelessness reduction funds to set up legal campgrounds and the use of less-regulated private contractors for encampment evacuations often fail to connect people with necessary services, damaging trust and hindering future cooperation (W. Denecke, personal communication. May 29, 2024).

1. Conclusion: Proposing a holistic framework

The 2017 Coyote Creek Flood highlighted the significant vulnerabilities faced by San Jose's homeless community, largely due to deficient warning systems and inadequate recovery efforts. This study emphasizes the urgent need for environmental justice research at the intersection of homelessness and flood risk management. To address this gap, we propose several key measures: 1) tracking the location of homeless encampments in relation to flood hazard zones for enhanced risk mitigation and loss prevention; 2) acknowledging and addressing the limitations of FIRMs to provide a clearer understanding of flood risks; 3) assembling an interagency task force to actively engage with this community; and 4) collecting data on the impacts of flood events on these communities for social services follow-up. Moreover, examining best practices for engaging with homeless populations offers insights for other communities confronting similar challenges. As a recommendation, we propose a comprehensive framework should be developed to assist local governments in integrating homelessness into their flood risk management strategies.

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