THE 9 JANUARY 2018 MONTECITO DEBRIS FLOWS:
A COMMUNITY'S ATTEMPT TO MITIGATE DEBRIS FLOW HAZARDS

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The 9 January 2018 debris flows (1-9 event) devastated the community of Montecito in southern Santa Barbara County, California. The community of Montecito is situated on coalesced debris fans formed on the coastal piedmont at the base of the Santa Ynez Mountains. Debris flows were triggered by rare but not unprecedented rains about a month after the 2017 Thomas fire. Voluminous debris flows erupted from the canyon mouths, quickly overwhelming alluvial fan creek channels and spreading coarse boulder and vegetative debris across the piedmont. The 1-9 event resulted in twenty-three fatalities, damaged or destroyed over 500 homes, damaged infrastructure including closing a main Highway corridor for thirteen days and caused an estimated billion dollars in economic losses.

Shortly after the catastrophic event, two non-profit organizations were established, The Project for Resilient Communities (TPRC) and the Partnership for Community Renewal (PRC). Both organizations attempted to develop additional mitigative structures on the creeks. The PRC focused on long-term solutions with debris basins, while TPRC focused on immediate solutions using debris flow nets. A project team was assembled for the PRC consisting of the author and Dr. J. David Rogers. Our objective was to develop a long-term Master Plan for development of debris basins in all the creeks to present to the County of Santa Barbara Flood Department.

We began preliminary study of the San Ysidro Creek watershed, and our preliminary mapping and analysis identified three ideal basin sites upstream of an existing, small debris basin. We also performed preliminary analysis of the Montecito Creek watershed which included the Cold Springs and Hot Springs tributaries and identified three locations upstream of an existing, small debris basin. One important discovery of our detailed geologic and geomorphic mapping was the presence of deep-seated bedrock landslides that posed a significant landslide dam hazard. We found evidence of landslide dam outbreak flood deposits on both tributaries and suspected these types of flood events had historically occurred.

Our team transitioned to TPRC who just completed construction of six debris nets. The County of Santa Barbara Flood Control Department was hesitant to build large debris basins as a local academist decreed that these large magnitude events only occur every 3,000 to 5,000 years. Having heard this pronouncement, the County's position was that it was not prudent for funds to be spent mitigating such rare events. As a result of this perception, our focus changed from identifying sites for debris basins to establishing the debris flow history of Montecito and surrounding Santa Barbara area. Our study was based on the principle: The Recent Past is the Key to Understanding the Near Future.

Historic records established that 40 debris flow and debris laden flood events, and 11 landslide dam outbreak flood events have occurred in the Montecito watersheds since 1825. Five, large magnitude debris flow and debris laden flood events were identified including 1825, 1861-62, 1914, 1995, and 2018 events with an average recurrence interval of 48 years. The 1825, 1861-62, and 1914 events produced debris flows from all of the watersheds in southern Santa Barbara County, and two 1995 debris laden flood events produced more debris than the 1-9 event. About 65% of the Montecito events occurred during post-fire conditions establishing the watersheds are sensitive to the environmental impacts of wildfires.

Our work concluded in 2023 with the filling of one debris flow net during debris laden floods five years after to the day of the 1-9 event. Prior to the following winter, the filled debris net was finally cleared, and all of the nets were removed. TPRC funding was exhausted by the cost for the clearing of debris from one net and removal of all the nets from the creeks, and our work abruptly ended. A debris basin was developed on San Ysidro Creek below the canyon mouth where a neighborhood of homes was destroyed. A question remains regarding this basin; will the next debris flow breakout from this creek channel to be diverted around the basin and impact the downstream community? The existing basins in the creeks of Montecito remain woefully undersized, and two of the basins are located below canyon mouths. It is a matter of time until the next 1-9 event occurs again, and so, the community remains at risk.