The Rose Canyon fault zone (RCFZ) bisects the City of San Diego, the 8th largest city in the U.S., and represents a major seismic hazard to the greater metropolitan area that includes Tijuana and surrounding cities. Onshore studies have shown that the RCFZ is a predominantly right-lateral, segmented, strike-slip fault zone that is capable of producing a M6.9+ event. However, little information exists on the timing of mid- to late-Holocene earthquakes, although the fault is known to have ruptured in the past few hundred years. Furthermore, rupture patterns between fault segments are not well constrained. To improve seismic hazard assessments of the San Diego region, it is vital to reconstruct the long-term paleoseismic history of the fault zone and to understand the rupture patterns between fault segments.

The Spanish Bight fault segment, which runs through the San Diego International Airport and splays into San Diego Bay, is a critical part of the RCFZ. San Diego Bay is a pull-apart basin created by a step in the RCFZ where subsidence and Holocene sedimentation record the paleoseismic history of the fault zone. Additionally, the Spanish Bight fault potentially records changes in fault character and slip history as the RCFZ approaches this transtensional step-over. We interpreted high-resolution Chirp sub-bottom data that was collected from within San Diego Bay offshore from the San Diego International Airport. We also extracted data from existing geotechnical reports, including cone penetrometer tests, core logs, and radiocarbon dates collected from beneath the airport. Together, these data will be used to generate a detailed active fault map and to resolve a stratigraphic framework between the airport and bay sediments. We will compare these data with the paleoseismic records from other onshore fault segments to identify rupture patterns and evidence for past earthquake clustering or triggering.