## Project Abstract

The objective of our project was to collect GPS data from the areas that surround the San Andreas and San Jacinto faults so that we could update the velocity vectors on a map of the area. Another major part of the data collection was to fill gaps in the San Bernardino mountain range by occupying stations that did not have previous data, starting a new data stream for future years. From June 21 to July 1, 2005 SCEC intern Adam Skalenakis and I participated in a two-week NSF-funded GPS campaign collecting data from twelve stations across the San Andreas and San Jacinto faults. We spent this time learning how to set up GPS equipment, collecting data and assisting 17 high school teachers, 13 undergraduates and 12 high school students with the same process. At each site for three to four days, eight hours of data was collected. After the campaign was over Adam and I went out to occupy eleven more stations in the San Bernardino Mountains in order to fill in gaps in SCEC's Crustal Motion Model 3 (CMM3). At least 24 hours of continuous data was collected from each of these sites. After the data collection, my part of the project was to process the GPS data using Auto-GIPSY. Auto-GIPSY is a web-service supported by the Jet Propulsion Laboratory (JPL) that retrieves Rinex files from a server and processes them using JPL's GIPSY software, which gave me the position of the station in terms of deviation from the nominal coordinates that were in the Rinex file. I then plotted the position as a function of time for each site and updated the velocity estimate for each site. I came across some complications when processing through Auto-GIPSY, but this was easily fixed by formatting the rinex file using TEQC, a program supplied by UNAVCO. I also went back to previous years and reprocessed data that did not process correctly the first time. After processing the data from the two- week campaign I processed and reprocessed about 70 files all together. From a total 221 data files that have been collected by the CSUSB-Harvey Mudd team since 2002, 82% have now been processed successfully. After three years of data collection the velocities are still somewhat uncertain. In particular 6106 has a velocity of about 11 cm/yr relative to North America. This is faster than the Pacific plate velocity of about 5 cm/yr and is thus unreasonable. The velocities of the remaining eleven stations seem more reasonable. Most of them are moving in a northwestern direction, 1.1 to 4.8 cm/yr, with the velocities generally increasing going southwestward on the Pacific plate. This is what would be expected for elastic strain accumulation along the San Andreas and San Jacinto faults. One-dimensional elastic modeling of our data suggests that the deformation is concentrated on and eastward of the San Andreas fault with relatively little deformation on the San Jacinto fault. However, because of the uncertainty of the velocities the results of the modeling are highly preliminary.