



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Danielle M. Golden	Project Number S0805
Project Title Death of a River: An Analysis of the Concentrations of Urban Contaminants in the Santa Ana River Watershed	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine whether or not urban contaminants have a negative effect on the health and safety of the Santa Ana River and if pollution increases as one travels along the waterway from Mill Creek in the San Bernardino Mountains to where it flows into the Pacific Ocean at Huntington Beach.</p> <p>Methods/Materials Water was sampled from ten specifically chosen locations along the Santa Ana River. Each sample was tested for pH at the location where the water was gathered. The following day, under the supervision of a certified chemist, the samples were also tested for presence/absence of Coliform and fecal Coliform bacteria using M Endo Agar and EC Medium, respectively. The concentrations of the anions chloride, nitrite, nitrate, phosphate, and sulfate were analyzed using Ion Chromatography. Results were then compared to the control, a sample of distilled water.</p> <p>Results The water proved to be of the highest quality at the locations nearest to the headwater of the Santa Ana at Mill Creek and water quality deteriorated quickly and significantly as it neared the ocean. More specifically, results of the pH tests proved the water to be generally alkaline, and excluding the first location tested at Mill Creek, bacteria was present everywhere. The concentrations of ions increased overall as the river traveled through city areas.</p> <p>Conclusions/Discussion My hypothesis was proven correct. As the water flowed through the urban city areas of the San Bernardino, Riverside, and Orange Counties, contaminants from urban runoff and pollution did indeed accumulate in the Santa Ana River, contaminating the water to an extremely unsafe and unhealthy point.</p>	
Summary Statement The Santa Ana River is indeed contaminated and unsafe, notably deteriorating in quality as it flows through urban areas due to runoff and uncontrolled pollution.	
Help Received I was driven to the locations where I gathered my water samples along the Santa Ana River by my elder cousin. Laboratory testing was done at the Riverside Water Quality Control Plant under the supervision of certified chemist Virginia Godoy. Credit to Greg Dueker of the Santa Ana Project Authority (SAWPA)	