



# CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

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| <b>Name(s)</b><br><b>Ethan Jean; Johnson Ku</b>   | <b>Project Number</b><br><b>S1210</b> |
| <b>Project Title</b><br><b>Water Quality in Silicon Valley</b>  |                                       |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>We strongly believe that urbanization has greatly impacted many watersheds in Silicon Valley due to the decrease of natural land, which increases chemical and ion concentrations in the creeks. Because of the rapid urbanization of this area, we wanted to analyze the effects on the water quality. The water quality in rural areas is better than that in urban areas due to different land use patterns and point source pollutions. With the increase in impervious area as the environment becomes more urban, the water is unable to penetrate the ground and filter out any chemicals and toxins.<br><b>Methods/Materials</b><br>We selected twelve sampling points located on four different watersheds around Silicon Valley and collected data for three months. During each visit, we used the Yellow Springs Instruments (YSI) Pro Plus meter to measure several parameters crucial to the analysis of water quality. The data was then compared to the most recent Environmental Protection Agency (EPA) standards set by the government. We compiled this data into an Excel spreadsheet and created several graphic images to display the data. Geographical Information System (GIS) softwares were used to process and map out the impervious area of the studied region.<br><b>Results</b><br>We observed that as we moved downstream, sampling points became more and more polluted due to higher impervious area percentages, and dissolved oxygen concentrations decreased. Alluvium formed creeks tended to have higher SPC values because the ions dissolved more easily in the alluvium formation as compared to other geological formations like JV.<br><b>Conclusions/Discussion</b><br>Urbanization will bring more pollution to ambient water, but with proper management plans, creek ecosystems can be preserved and sustained. For example, Google proposed best management plans throughout the course of the construction, which proved to be effective in the conservation of the creek's health. |                                       |
| <b>Summary Statement</b><br>Through GIS softwares and different lab equipment, we analyzed water quality in Silicon Valley and the trends that are apparent between factors of water pollution.   |                                       |
| <b>Help Received</b><br>We received aid in taking photos for us while we were conducting lab tests, and our teacher/project advisor helped out through teaching us how to use the Dionex Ion Analyzer and how to interpret the data.  |                                       |