



CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

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Project Title Water Temperature: Does It Affect Salmonid Growth?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project was to collect sufficient data to relate water temperature to salmonid development in the San Lorenzo River. Our hypothesis is that salmonids will have a greater median size at sites with relatively warmer water.</p> <p>Methods/Materials To monitor these temperatures, we launched HOBO devices at twenty sites along the river. (HOBOs are probes that allow for continuous monitoring of a certain factor.) We started collecting temperature data June of 2005 and continued through the end of October. We then compared these numbers with historical fish counts provided by our mentor.</p> <p>Results The data we collected shows that salmonids within the San Lorenzo River grow larger at sites with warmer water. The data in the scatter plot most closely follows the exponential equation $y=(7.62095)(1.143630)^x$. This equation suggests that, at least in the San Lorenzo River, as the average of the minimum and the maximum of the rolling average of temperature increases, so does the median young of the year steelhead standard length.</p> <p>Conclusions/Discussion In conclusion we found that salmonid growth does seem to be enhanced by warmer water temperatures, proving our hypothesis correct. We combined the temperature data we collected in 2005 with Don Alley's young of the year steelhead standard length data from the years 1998 and 2005. Because Don did not collect data in 2005 from all of the same sites we used, he suggested utilizing his 1998 fish length data. The rainfall amounts for 1998 were very similar to those of 2005, which allows us to assume that the stream-flows (and therefore temperatures) were about equal as well. After combining the 1998 and 2005 fish length data, we compared each site's median to the average of the maximum and the minimum of the rolling average of the temperatures for that site. A scatter-plot of these data shows the correlation between them. The regression line that the data most closely follows is exponential: $y=(7.62095)(1.14363)x$. The r-value (correlation on a scale of 0 to 1) was .8027, which indicates a relatively strong correlation between fish length and temperature. This leads us to believe that the variables are not simply related by chance, but rather that there is a cause and effect relationship between them, meaning warm water temperature, at least in the San Lorenzo River, is a direct cause of larger salmonid length.</p>	
Summary Statement This project explores the correlation between steelhead length and water temperature in the San Lorenzo River, and has shown that the warmer the water at a particular site is, the larger the young of the year are for that site.	
Help Received Fish biologist Don Alley provided the background data for our project, and teacher Jane Orbuch helped us to develop a hypothesis and write up our results.	