



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Madison P. Meredith	Project Number S1116
Project Title An Assessment of the Environmental Health of the Water Quality of Success Lake in the Southern Sierra Nevada Mountains	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Most often, the concern about water is 'quantity' or how much is available. However, an equally important concern should also be the 'quality' of this available water. Water quality can be determined by measuring parameters such as temperature, conductivity, pH, nitrate, phosphate and chloride. This study examines three questions on the water quality of Success Lake in Porterville, California: (a) how environmentally healthy is the quality of water in Success Lake? (b) has the environmental health of the water in Success Lake changed over time? and (c) do the three different tributaries affect the environmental health of the water in Success Lake?</p> <p>Methods/Materials Eight locations were sampled twice a week for three weeks during the months of February/March 2012 using a hand-held YSI Professional Plus multi-parameter instrument. The probe was kept at a depth of 1 meter or less (epilimnion level). Grab samples were taken from two site locations inside the lake and were tested for nitrate, phosphate, and chloride. The ARCGIS program was used to generate the maps for all sample sites located within each watershed.</p> <p>Results My data revealed an average temperature of 14.19°C, conductivity between 91.2 and 228.2 $\mu\text{S}/\text{cm}$, and a pH range of 4.55 to 11.27. Grab samples collected from the lake did not detect any abnormal ranges of nitrate and phosphate, but both showed an above average level of chloride contamination. Compared to the US Army Corps of Engineers data from 2002, 2008, and 2011, the data reveals that temperature, conductivity, and pH have increased. A correlation statistical analysis of the parameters relationship with temperature was conducted. Conductivity showed a relation, while pH showed no relation. Results can be observed.</p> <p>Conclusions/Discussion Water quality can be monitored accurately through the testing of temperature, conductivity, pH, nitrate, phosphate and chloride. Water quality monitoring should be kept not only in the lake itself, but also within the three tributaries leading into the lake. This study provides the foundation for an inferred water quality issue. Data from this test was compared to similar previous testing done by the USACE, showing the tested parameters have increased over time. Further research would be needed, not only testing the parameters listed already, but also things such as coliform and total bacteria, over a longer analysis time period.</p>	
Summary Statement A study on the water quality of Success Lake in the Southern Sierra Nevada Mountains determined by physical parameters and their effects on the water now compared to past testing.	
Help Received Used field equipment from Tule Reservation, supervised by Kerri Vera; Used lab equipment from City of Porterville, supervised by Micheal Cotton.	