



# CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

<b>Name(s)</b> <b>Evan M. Bozanic</b>	<b>Project Number</b> <b>J1201</b>
<b>Project Title</b> <b>Differential Fish Count: Rebreather vs. Open Circuit</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective was to determine whether a diver would see more Paralabrax clathratus (an overhunted species of sea bass living off the coast of California) with a rebreather or with open circuit scuba. The hypothesis was that one would see more fish using a close circuit rebreather than open circuit scuba.</p> <p><b>Methods/Materials</b> Before diving, it was necessary to build a closed circuit scuba system to accommodate smaller sized individuals. Two weeks was spent building and modifying the rebreather. Open circuit testing was done using standard scuba equipment. Three weeks was spent training to use the rebreather and understanding mixed gas physiology. A team of four divers went to Shaw's Cove in Laguna Beach to do testing. A 50 meter semi-permanent transect line was placed at 6 meters of depth. 34 transects on open circuit scuba and 25 on closed circuit rebreather were conducted in 17 man dives (15 hours). Fish counts were recorded on underwater slates. The data was statistically analyzed looking at mean, median, standard deviation, confidence interval, and student T test.</p> <p><b>Results</b> Data showed that a median of 2 fish was seen on open circuit scuba and 5 fish were seen on closed circuit rebreathers. A standard deviation of one was obtained giving a confidence interval of 95%. Using student T test analysis, a P value less than 0.05 was calculated, showing the means of the two groups were statistically different.</p> <p><b>Conclusions/Discussion</b> More accurate fish counts can be obtained using closed circuit rebreathers instead of open circuit scuba. Differences in fish counts can be explained by disturbance from bubbles generated by open circuit scuba. Closed circuit rebreather technology would be useful for observing elusive fish species, getting accurate counts and ultimately helping to formulate fishing quotas.</p>	
<b>Summary Statement</b> The objective of this project was to ascertain the most accurate method of doing fish counts by using either a closed circuit rebreather or open circuit scuba for the purpose of creating better fishing laws.	
<b>Help Received</b> Dive Team: Brenna Bozanic, Jeff Bozanic, Edward Tu, Debi van Zyl. Rebreather Construction: Al Bane, Jeff Bozanic, Beth Durbin, Web Jessip Titan Dive Gear. Graphics/Editing: Edward Tu, Debi van Zyl.	