



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jacki S. Edens	Project Number S1810
Project Title Bubble Screens: Mitigating Noise Pollution in the Ocean	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to try and mitigate simulated industrial noises with air bubbles in water to reduce the effect of sound, thereby providing a possible reduction of noise pollution for marine mammals in the future. I hypothesized that the bubble screen would reduce the noise level (measured in mV at certain hertz ranges) produced by the projected noise.</p> <p>Methods/Materials I tested this by placing a circle of perforated rubber tubing on the sea floor connected to a scuba tank at a depth of 12 feet. The ambient noise was recorded using a Guitar Hero microphone housed in a protective covering that was plugged into a computer and recorded using AudioXplorer #. In the center of the bubble circle, a tape recorder was placed on #play# after recording a running Skilsaw #. Recordings of this noise was taken at various depths: at 8-feet, 4-feet, and on the surface. The tank was turned on, and the air ran through the hose to create bubbles. The sound was then recorded again at the same depths.</p> <p>Results The desired effect was not achieved by the bubbles being transmitted because the bubbles coming from the tubing was louder (1.25 mV*) than the noise in ambient conditions (0.5 mV)</p> <p>Conclusions/Discussion This evidence did not support my hypothesis. However, if proper materials were used to fully test this idea, I believe the reduction of noise through air created by bubbles could be produced. There was an unfortunate artifact in the experimental procedures; the noise generated by the tape recorder was not adequately louder than the noise produced from the bubble tubing. If I could build something that represents a wall of air in the water, and have a device capable of generating at least 3 mV, it would allow for a more direct testing of the effect of air on the sound traveling through water.</p>	
Summary Statement This project is about mitigating industrial noise pollution through air in the ocean.	
Help Received Teacher, Kim Quaranta supported me and dove for me; Dion Johnson supplied BC; Rob Haas controlled the boat and outfitted our diver; My dad, Jim Edens, Drove me around	