



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jacki S. Edens	Project Number 31071
Project Title Bubble Screens: Mitigating Noise Pollution in the Ocean	
Abstract 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. 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 Skisaw #. 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. 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) 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.	
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	