



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Makena M. Crimaldi</b>  | <b>Project Number</b><br><br>36168 |
| <b>Project Title</b><br><b>Shark Stopper: The Use of Samarium and Magnesium to Prevent Shark Attacks</b>   |                                    |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The Shark Stopper Experiment tested if Samarium or Magnesium attached to a wetsuit, can prevent shark attacks.<br><b>Methods/Materials</b><br>Based on the shark's senses in it's head, the Samarium block or Magnesium wire attached to the wetsuit was predicted to reduce the number of shark attacks on the wetsuit and the bait. A shovel nose shark (Rhinobatos productus) was feed for five days in a row testing different types of metals and amounts when attached to a wetsuit. The metals included Samarium block, multiple length of Magnesium wire, stainless steel wire, Nickel Titanium wire, and brass tubing.<br><b>Results</b><br>In days one through four, Samarium and Magnesium keep the shark away, but the Magnesium had a stronger reaction from the shark. On the fifth day, the shark ate all the fish, even the ones with the Magnesium or Samarium near it. This shows that the shark probably got used to the metals and the metals did not bother the shark's electrical sensors anymore.<br><b>Conclusions/Discussion</b><br>The hypothesis was Samarium block or Magnesium wire attached to the wetsuit will reduce the number of shark attacks on the wetsuit and the bait. The experiment and results proved that the hypothesis was correct. It was correct because the number of shark attacks decreased after putting the Samarium block or Magnesium wire in the wetsuit. Based on the results, Magnesium and Samarium may be useful in wetsuits to reduce shark interactions and attacks. However, additional testing must be done on bigger sharks. |                                    |
| <b>Summary Statement</b><br>The Shark Stopper Experiment studied the effects of Samarium and Magnesium on a shovel nose shark during feeding to simulate if shark attacks could be reduced with the use of these metals.   |                                    |
| <b>Help Received</b><br>Dr. Chris Lowe at CSU Long Beach, Dr. Andrew Nosal at UC San Diego, and Dr. Patrick Rice at Florida Keys Community College all provide information on sharks and reviewed the test plan. Encinitas Tropical Fish Store provided access to the Shovel Nose Shark.   |                                    |