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Electropositive Metals as Potential Shark Deterrents.

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The purpose of this study is to reduce shark by-catch from commercial long-line fishing. In order to accomplish this goal, electropositive metals are being investigated as potential shark deterrents. Sharks are caught in large numbers as by-catch in commercial long-line fishing. This is detrimental to shark populations since sharks typically have life history traits that make them susceptible to overfishing. Shark by-catch is also problematic and economically costly to fishermen. Electropositive metals are metals that when placed in an electrolyte, such as seawater, give off an electric current. Unlike bony fish, sharks have the ability to detect electrical stimuli in the environment. Electropositive metals are thought to produce electric fields much greater than those found in nature. Several studies have shown that sharks will avoid electropositive metals, but none of these studies have quantified the voltage produced by the electropositive metals. The voltage of six electropositive metals and two control metals was determined using electrodes in a tank with flow-through seawater. The voltage was recorded at 10 distances, ranging from 1-30cm, from the electrode. Machines were used to precisely and accurately move the metals to the various distances and to dip them into the seawater. Six replicates of each of the eight metals were recorded. The electropositive metals produce significantly larger voltage outputs than the controls. The distance that the metals are most effective is less than 15cm. The electropositive metals show promising voltage that sharks can detect and have the potential to deter sharks.