# Weathering of lead bullets and their environmental impacts at outdoor shooting ranges in Florida. (S11-cao163540-Poster)

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# Abstract:

Lead contamination at shooting range is of great environmental concern. This study focused on weathering of lead bullets and their impacts on the environment at five outdoor shooting ranges in Florida. Hydrocerussite, cerussite, and massicot were present in the weathered bullet crusts from younger shooting ranges, whereas only hydrocerussite was detected from older shooting range. Less soluble hydroxypyromorphite was formed in a Prich berm soil. Total Pb and TCLP Pb in the soils from all five shooting ranges were significantly elevated with the highest Pb concentration being up to 5% in berm soils. In one shooting range, elevated Pb of up to 522ppm was observed in subsurface soils. This may be due to the high cation exchange capacity of the soil coupled with enhanced solubilization of organic Pb complex at alkaline pH. Elevated total Pb concentrations in Bermuda grass and surface water were also observed in some ranges. Ranges with high P concentration and high CEC showed lower Pb mobility. Our research clearly demonstrates the importance of properly managing shooting ranges to minimize their adverse impacts to the environment.

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