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Toxicity Laboratory Intercalibration for Stormwater in Southern California

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Abstract

Because of the expansive urbanization of watersheds in southern California, the monitoring of stormwater has become increasingly important. Nearly a million dollars is spent each year monitoring stormwater toxicity. This work is funded by multiple agencies, conducted by many different laboratories, and uses several test organisms. A group of the agencies, the Southern California Stormwater Monitoring Coalition, has a goal of combining all of the data sets that have been generated to make spatial and temporal comparisons. This is challenging because while the laboratories are using standardized test methods, there are options and room for interpretations in the protocols that allow some variation in procedures. As a result, an intercalibration exercise was conducted to assess the comparability of results between laboratories. A total of nine laboratories tested split samples of dilution water, copper spiked dilution water, simulated runoff and a duplicate of one of these matrices. In the first round, tests were conducted using survival and reproduction of water flea *Ceriodaphnia dubia*, 96 hr. survival of the freshwater amphipod *Hyaella Azteca*, 48 hr larval development of the salt water mussel *Mytilus galloprovincialis*, and 72 hr larval development of the sea urchin *Strongylocentrotus purpuratus*. Each laboratory was allowed to use their normal protocols. The round one results found good comparability for the two marine tests, but relatively poor comparability for amphipod survival and water flea reproduction. A survey of the laboratories indicated several differences in protocols for the two freshwater tests. A second round of testing for just the freshwater tests occurred with more standardization of procedures. Comparability of the amphipod test was greatly improved, but the water flea reproduction endpoint remained relatively poor. For both rounds, the most comparable results were achieved on the simulated runoff samples indicating a possible matrix issue with dilution water samples between laboratories.