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Selection of methods for assessing sediment toxicity in California bays and estuaries

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ABSTRACT

Toxicity tests are often used in sediment assessment programs. However, the choice of methods has been largely limited to acute tests. Where sublethal methods have been used, there has been little consistency among programs in the types of the sublethal tests used. The goal of this study was to develop a method for choosing a suite of acute and sublethal tests for use in a California statewide assessment program, and to develop a set of method-specific thresholds for classifying the degree of toxicity within a multiple line of evidence framework consisting of sediment chemistry, benthic community structure, and sediment toxicity. A group of candidate methods was evaluated using feasibility and performance criteria. Toxicity thresholds were calculated based on test variability and sensitivity. As a result of the evaluation, 3 acute toxicity methods using amphipods (*Eohaustorius estuarius*, *Rhepoxynius abronius*, and *Leptocheirus plumulosus*), and 2 sublethal methods using a polychaete and mussel embryos (*Neanthes arenaceodentata* growth and *Mytilus galloprovincialis* embryo development at the sediment-water interface) were selected for recommendation. Thresholds for toxicity categories corresponding to Nontoxic, Low Toxicity, Moderate Toxicity, and High Toxicity were developed for each test method. Although these toxicity categories and thresholds provide a consistent framework for the interpretation of test results among different methods, additional research is needed to determine their effectiveness for predicting impacts to benthic communities.

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