

SCCWRP #219

Development and testing of sea urchin embryo test methods for use in nationwide monitoring of marine and estuarine environments

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ABSTRACT

This report summarizes the biological data obtained from tests of the toxicity of sediment elutriates to sea urchin embryos. The principal objective of this study was to provide data that will allow the performance of the sea urchin embryo toxicity test to be evaluated relative to other promising sediment toxicity test methods. In addition, this project was designed to compare the relative sensitivity of several different test endpoints and several urchin species. It was hoped that these data would aid in the selection of the best test methods for future use by NOAA.

Bulk sediments from five sites in San Francisco Bay and Tomales Bay were collected for testing. Replicate seawater elutriates were prepared from each sample and used in toxicity tests with sea urchin embryos and sperm. Three different methods of examining 38 hr embryo samples were evaluated in this project. These methods were evaluated in this project. These methods were: microscopic examination of whole embryos, measurement of echinochrome pigment production, and cytologic/cytogenic examination of embryo cells. The results from these tests were compared to embryo cells. The results from these tests were compared to determine the relative sensitivity and variability of each technique. The correspondence of changes in these tests to variations in sediment chemistry was also investigated using factor analysis and regression techniques.

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