

SCCWRP #472

## Comparative Sediment Quality Guideline Performance For Predicting Sediment Toxicity in Southern California, USA

Doris E. Vidal<sup>1</sup>, Steven M. Bay<sup>1</sup>

<sup>1</sup>*Southern California Coastal Water Research Project, 7171 Fenwick Lane, Westminster, California 92683 5218, USA*

### ABSTRACT

Several types of sediment quality guidelines (SQGs) are used by multiple agencies in southern California (USA) to interpret sediment chemistry data, yet little information is available to identify the best approaches to use. The objective of this study was to evaluate the predictive ability of five SQGs to predict the presence and absence of sediment toxicity in coastal southern California: the effects range-median quotient (ERM<sub>q</sub>), consensus moderate effect concentration (consensus MEC), mean sediment quality guideline quotient (SQGQ<sub>1</sub>), apparent effects threshold (AET), and equilibrium partitioning (EqP) for organics. Large differences in predictive ability among the SQGs were obtained when each approach was applied to the southern California data set. Sediment quality guidelines that performed well in identifying nontoxic samples were not necessarily the best predictors of toxicity. In general, the mean ERM<sub>q</sub>, SQGQ<sub>1q</sub>, and consensus MEC<sub>q</sub> approaches had a better overall predictive ability than the AET and EqP for organics approaches. In addition to evaluating the predictive ability of SQGs addressing chemical mixtures, the effect of an individual SQG value (DDT) was also evaluated for the mean ERM<sub>q</sub> with and without DDT. The mean ERM<sub>q</sub> without DDT had a better ability to predict toxic samples than the mean ERM<sub>q</sub> with DDT. Similarities in discriminatory ability between different approaches, variations in accuracy among SQG values for some chemicals, and the presence of complex mixtures of contaminants in most samples underscore the need to apply SQGs in combination, such as the mean quotient. Management objectives and SQG predictive ability using regional data should be determined beforehand so that most appropriate SQG approach and critical values can be identified for specific applications.

**Due to distribution restrictions, the full-text version of this article is available by request only.**

Please contact [pubrequest@sccwrp.org](mailto:pubrequest@sccwrp.org) to request a cop