

Transitioning sediment quality assessment into regulations: Challenges and solutions in implementing California's sediment quality objectives

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ABSTRACT

Development and promulgation of sediment quality criteria represents a substantial challenge for water quality agencies. Unlike water quality programs that rely on individual chemical thresholds to assess water quality, the complex processes affecting contaminant bioavailability in sediments preclude the use of contaminant concentrations to independently assess impacts or identify cause. Various multiple line of evidence approaches (e.g., sediment quality triad) have been developed for sediment quality assessment, but such frameworks are rarely fully incorporated into statewide regulatory programs due to a lack of standardized and validated tools. In 2003, California's State Water Resources Control Board (State Water Board) initiated development of sediment quality criteria and an assessment framework that required the developers to resolve many challenging technical and policy related issues to the satisfaction of stakeholders, scientists, and the general public. The first part of this multiyear effort has been completed and resulted in the development and validation of an integrated collection of tools, thresholds, and a data interpretation framework for assessing sediment contamination impacts on benthic community condition. The State Water Board's narrative sediment quality criteria and assessment framework became effective in 2009, following US Environmental Protection Agency approval. The results of this effort are described in a series of 6 articles published in this issue of Integrated Environmental Assessment and Management. The articles describe: 1) a multiple line of evidence framework for data integration and assessment, 2) calibration and evaluation of sediment quality guidelines for predicting toxic responses, 3) development and evaluation of sediment quality guidelines with respect to benthic macrofauna responses, 4) selection of toxicity test methods and thresholds, 5) identification and characterization of benthic community assemblages, 6) the effect of sampling methods on benthic community assessment, and 7) recommendations on improving the assessment of contaminant exposure in sediment quality assessment. This collection of articles illustrates the steps needed to improve the scientific foundation for sediment quality assessment in regulatory applications.

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