

Integrating probabilistic and targeted compliance monitoring for comprehensive watershed assessment

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ABSTRACT

Environmental monitoring typically falls into one of two broad categories. Targeted designs, utilizing fixed stations, focus on describing and quantifying impacts, tracking trends, and assessing compliance with regulatory guidelines or limits. Probabilistic designs, in contrast, draw sampling stations at random from an area or region, and the stations are used to describe conditions in the region of interest based on a subpopulation of sites. These two design approaches are usually viewed as mutually exclusive, with randomized designs used for broader regional assessments of overall ambient condition and targeted designs for demonstrating regulatory compliance and/or characterizing specific, localized impacts. Combining elements of both approaches into a single design provides benefits not available from either design alone. Embedding targeted monitoring within the framework of a probabilistic design enables data from targeted stations to be viewed in a more accurate regional context and provides a consistent background against which to identify characteristic regional patterns of contamination and impact. We use the San Gabriel River Regional Monitoring Program, recently implemented in southern California, to illustrate the structure of a hybrid design and how it enables data analyses and assessments that provide a more complete picture of conditions in the watershed. For example, the hybrid design showed that approximately 80% of the metals levels at compliance sites were below the 25th percentile of the overall watershed condition as indicated by the probabilistic sampling.

Full Text

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07_171_182.pdf