

MONITORING PESTICIDES FOR TMDL DEVELOPMENT IN THE SAN JOAQUIN RIVER BASIN, CALIFORNIA

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Biographical Sketch of Authors

Charles Kratzer is the study unit chief for the San Joaquin-Tulare Basins study unit of the USGS National Water Quality Assessment (NAWQA) Program. In addition to his NAWQA responsibilities, he has led several monitoring efforts related to pesticide and nutrient transport and stream travel times. Shakoora Azimi is the staff scientist with the State regulatory agency who is responsible for developing a TMDL for diazinon and chlorpyrifos in the San Joaquin River Basin. Her responsibilities include monitoring, source analysis, laboratory analyses, and quality assurance.

Abstract

The California Regional Water Quality Control Board, Central Valley Region has scheduled the lower San Joaquin River basin for development of Total Maximum Daily Loads (TMDL) for diazinon and chlorpyrifos, organophosphorus insecticides that have both agricultural and urban applications. However, because of the dominance of agricultural land use, urban sources represent a relatively small part of the load at the basin outlet. Diazinon is primarily applied during winter to dormant orchards, with lesser amounts applied during summer to orchards and truck crops. Chlorpyrifos is primarily applied during summer to orchards, with lesser amounts applied during spring to alfalfa and during winter to dormant orchards. Thus, January through September is the main period of concern for transport of diazinon and chlorpyrifos. Within this time period, two monitoring approaches are needed — winter storm sampling in January and February and fixed-interval sampling during March through September.

An unresolved question is the amount of pesticide load transported by wet and dry deposition. Agricultural sources of these insecticides have been monitored since 1991, while urban sources have been monitored only in 1995 and 2001. Wet deposition was sampled during winter storms at eight sites in 2001, four in an urban area and four in outlying orchard areas; whereas dry deposition was sampled at two sites, one in the urban area and one in an outlying orchard area. Additional wet and dry deposition monitoring is planned for 2002 and 2003. The monitoring information will be evaluated to design a more efficient and cost-effective monitoring program for the TMDL.