

Profiling Areas Vulnerable to Ground Water Contamination by Pesticides in California.
Troiano, J., B. Johnson, S. Powell, and S. Schoenig. EH 92-09. 1992.

Abstract

Identifying areas vulnerable to ground water contamination by pesticides is desirable because pollution prevention policies could be developed for specific locations. Previous attempts to correlate predicted levels of vulnerability with measures of the absence and/or presence of pesticide residues in well water have not been entirely satisfactory. Poor correlation between predicted level of vulnerability and occurrence of pesticide residues in well water may have been caused by assuming that only the leaching pathway was involved or by uncertainties in the use of well sampling data as an indication of vulnerability. An alternative approach was devised that produced classification algorithms based on climatic and soil data from known vulnerable (KV) sections. KV sections in California are defined as 1 square mile areas of land where pesticide residue has been detected in well water samples and the detection attributed to nonpoint source agricultural applications. Clustering procedures were used to group similar KV sections first with respect to climate data and then with respect to soil data. Principal Components Analysis was used to construct soil profiles of the clusters. The profiles were used as the basis for a classification procedure to determine if soil properties of candidate sections with unknown vulnerability were similar to profiles developed for KV sections. Since this scheme is based only on data from KV sections, candidate sections with dissimilar profiles cannot be considered as non-vulnerable; they receive a status of non-classifiable. However, the process is flexible and it can be revised to incorporate updated well sampling information.