

**Update of the California Vulnerability Soil Analysis for Movement of Pesticides to Ground Water: October 14, 1999. Troiano, J., F. Spurlock, and J. Marade. EH 00-05. 2000.**

**Abstract**

The CALVUL approach to determining spatial vulnerability to ground water contamination has been previously described (Troiano et al., 1994; Troiano et al. 1997; Troiano et al., 1999). CALVUL is an empirical approach because it attempts to identify similar geographic features amongst sections of land where pesticide residues have been found in ground water. Two unique features of this approach are: 1) that no *a priori* determination is made regarding the pathway for pesticide movement to ground water; and 2) that no relative scale of vulnerability is derived between land areas. This report describes a revision in the clustering analysis of soil data. The revision was conducted because the number of sections with pesticide detections had approximately doubled since the initial development of the CALVUL approach. All of the sections used for this revision originated from DPR investigations which assured that sampled wells had met all aspects of a non-point source determination, especially with respect to visual inspection of well sites. In addition, the soil data tables originally obtained from the National Resource Conservation Service (NRCS) had been updated. The results of this analysis were very similar to the initial clustering analysis. Variables that were important in discriminating clusters were permeability, shrink -swell potential, presence of a hardpan soil layer, and presence of an annual water table. Soil texture in the initial analysis was reflected in values for the No 200 sieve. In this revision, soil texture was indicated by the combination of permeability and shrink -swell potential. Coarse soils were characterized by high permeability values and no shrink -swell potential whereas clayey soils were characterized by very low permeability values and high shrink -swell potential. These observations were compared to the No200 sieve sizes to validate this observation. Although this revision indicated a greater number of clusters, there was better correspondence to general soil maps. The addition of water table as a cluster variable provided greater separation primarily between clayey soils. Presence of a water table could be an important variable in the development of mitigation measures and it is one of the observations that require further investigation.