

Summary of USGS Remarks on Pesticides/Chemicals
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The National Water-Quality Assessment Program (NAWQA) began in 1991 to assess the water-quality conditions of the Nation's largest river basins and aquifers. Two of the NAWQA study units are within the Great Lakes watershed and other study units are adjacent to the watershed. These NAWQA studies provide information on the occurrence of pesticides and chemicals in streams and ground water of urban and agricultural areas.

Some general findings of the first cycle of the studies concern the various factors that control pesticide occurrence in streams and ground water. Pesticides that are commonly applied to farm fields were typically detected in surface water in intensively farmed areas at concentrations up to 100 times higher than less intensively farmed areas. Highest concentrations of pesticides in surface water occur during runoff in agricultural areas soon after pesticide applications to farm fields. Pesticides were also detected in nearly all samples of water from wells installed in shallow surficial aquifers in intensively farmed areas underlain by relatively permeable surficial deposits. They were also detected in water samples from some drinking water wells especially those not overlain by relatively impermeable confining units.

Concentrations of cadmium, copper, mercury, nickel, lead, and zinc as well as many toxic synthetic organic compounds were highest in fine river sediments in streams that drained urban areas compared with other land uses. Water quality, as indicated by aquatic life, was most influenced by land use and type of surficial deposit. For example, aquatic life was most degraded in urban areas and least degraded in forested areas. Water quality in streams in primarily agricultural areas was less degraded in the basins with a higher percentage of forested land use. A major national finding of the early NAWQA studies was the frequent detection of organophosphate insecticides in urban streams near, at, or above aquatic life criteria.

The NAWQA Program is beginning a new cycle of studies that will address five broad topics: 1) the effects of urbanization on stream ecosystems, 2) the transport of contaminants to water-supply wells, 3) mercury accumulation in aquatic organisms, 4) sources and transport of agricultural chemicals, and 5) the effects of nutrient enrichment on water in streams flowing through agricultural areas. Other USGS Programs are continuing evaluations of emerging contaminants.