Pesticides in Farmland Streams and Groundwater

What Is This Indicator, and Why Is It Important? This indicator reports on pesticides found in farmland streams and groundwater. The graphs on the top show the average number of pesticides detected throughout the year in streams and shallow groundwater wells. The graphs on the bottom show the percentage of streams and shallow groundwater wells with pesticide concentrations that exceeded standards and guidelines (benchmarks) set for the protection of human health or aquatic life. These graphs report currently used agricultural pesticides and selected breakdown products of these pesticides, as well as selected organochlorine insecticides that were widely used in the past but whose use is no longer permitted in the United States.

The number of pesticides detected is important, but the presence of pesticides does not necessarily mean that the levels are high enough to cause problems. Comparison with benchmarks provides a useful reference to help judge the significance of contamination.

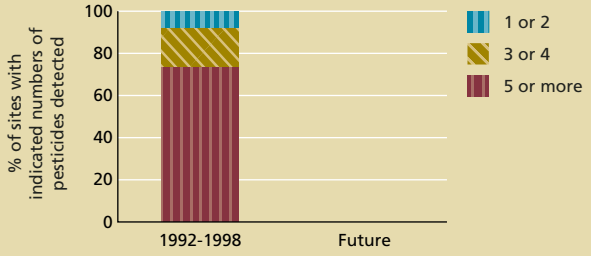
However, drinking water standards or guidelines do not exist for 33 of the 76 pesticides analyzed, and aquatic life guidelines do not exist for 48 of the 76 compounds. Current benchmarks do not account for mixtures of chemicals and seasonal events involving high concentrations. In addition, potential effects on the reproductive, nervous, and immune systems, as well as on particularly sensitive people, are not yet well understood.

What Do the Data Show? All monitored streams in farmland areas had at least one pesticide at detectable levels throughout the year, and about 75% had an average of five or more. Eighty-three percent of streams had at least one pesticide whose concentration exceeded aquatic life guidelines; about 4% had one or more compounds that exceeded human health standards or guidelines.

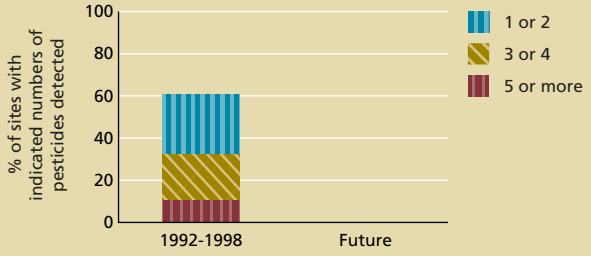
About 60% of groundwater wells in farmland areas had at least one pesticide at detectable levels, and less than 1% had any pesticides that exceeded human health standards or guidelines.

Pesticide Occurrence

Agricultural Streams



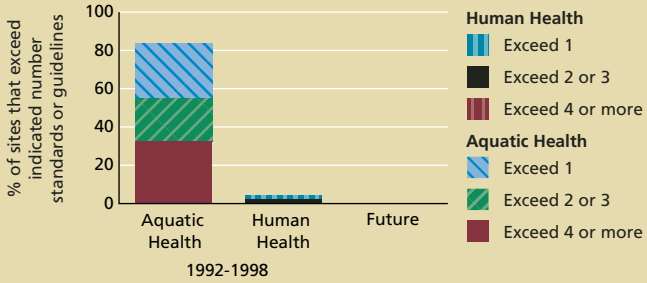
Agricultural Groundwater



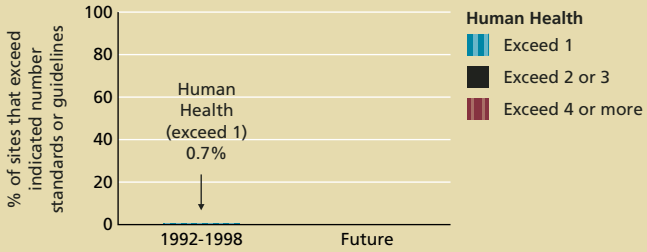
Data Source: U.S. Geological Survey National Water Quality Assessment Program (NAWQA). Coverage: lower 48 states.

Pesticides above Standards or Guidelines

Agricultural Streams



Agricultural Groundwater



Data Source: U.S. Geological Survey National Water Quality Assessment Program (NAWQA). Coverage: lower 48 states.

Note: aquatic life standards are not currently applied to groundwater.

Pesticides in Farmland Streams and Groundwater *(continued)*

Discussion The data shown here do not represent assessments of the risks posed to people or ecosystems in any specific location, since they do not incorporate factors such as whether the water tested is actually used as a drinking water source and the time of year when the pesticides are found, relative to when animals are most active.

Guidelines for the protection of aquatic life are often numerically lower than standards and guidelines to protect human health. Aquatic animals spend much or all of their life in water, and may be more sensitive than people to specific contaminants. People consume drinking water from both streams and groundwater, thus human health standards and guidelines apply to both. Guidelines to protect aquatic life are not applied to groundwater.

The pesticides reported here are generally associated with agriculture, but some may have other uses (currently or in the past). Thus, not all contamination is necessarily attributable to agricultural use.

See also the national, coastal, and urban contaminants indicators (pp. 48, 72, and 189).

The technical note for this indicator is on page 234.