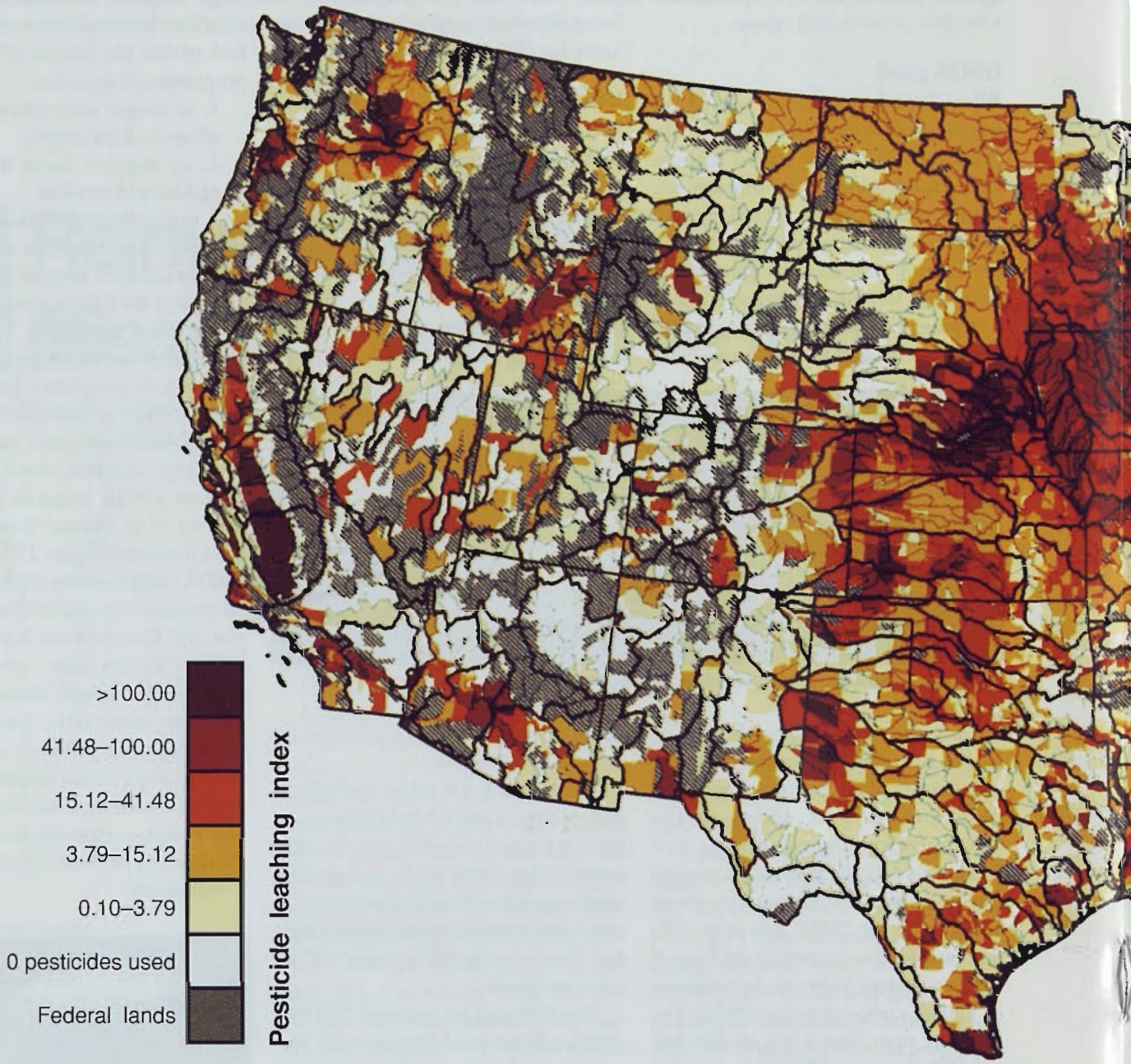
Graphically speaking

Pesticide leaching potential from crop pro



The people who contributed to this feature are Margaret Maizel, National Center for Resource Innovations; George Muehlbach, National Center for Resource Innovations; Don Goss, Texas Agricultural Experiment Station; and Robert Kellogg, Soil Conservation Service.

The map shows the geographic location and severity of potential pesticide leaching below the crop root zone. The severity, as shown by the colors on the map, is based on a pesticide leaching index developed by the National Center for Resource Innovations (NCRI) and the USDA. The darker areas are the most vulnerable.

The research that produced this map advances the earlier work of Lee and Nielsen (CHOICES, Third Quarter 1988). The map was created using extensive and detailed information from 800,000 sample points of the National Resources Inventory database. The Lee and Nielsen study was based on well-water test data, which was a much smaller database.

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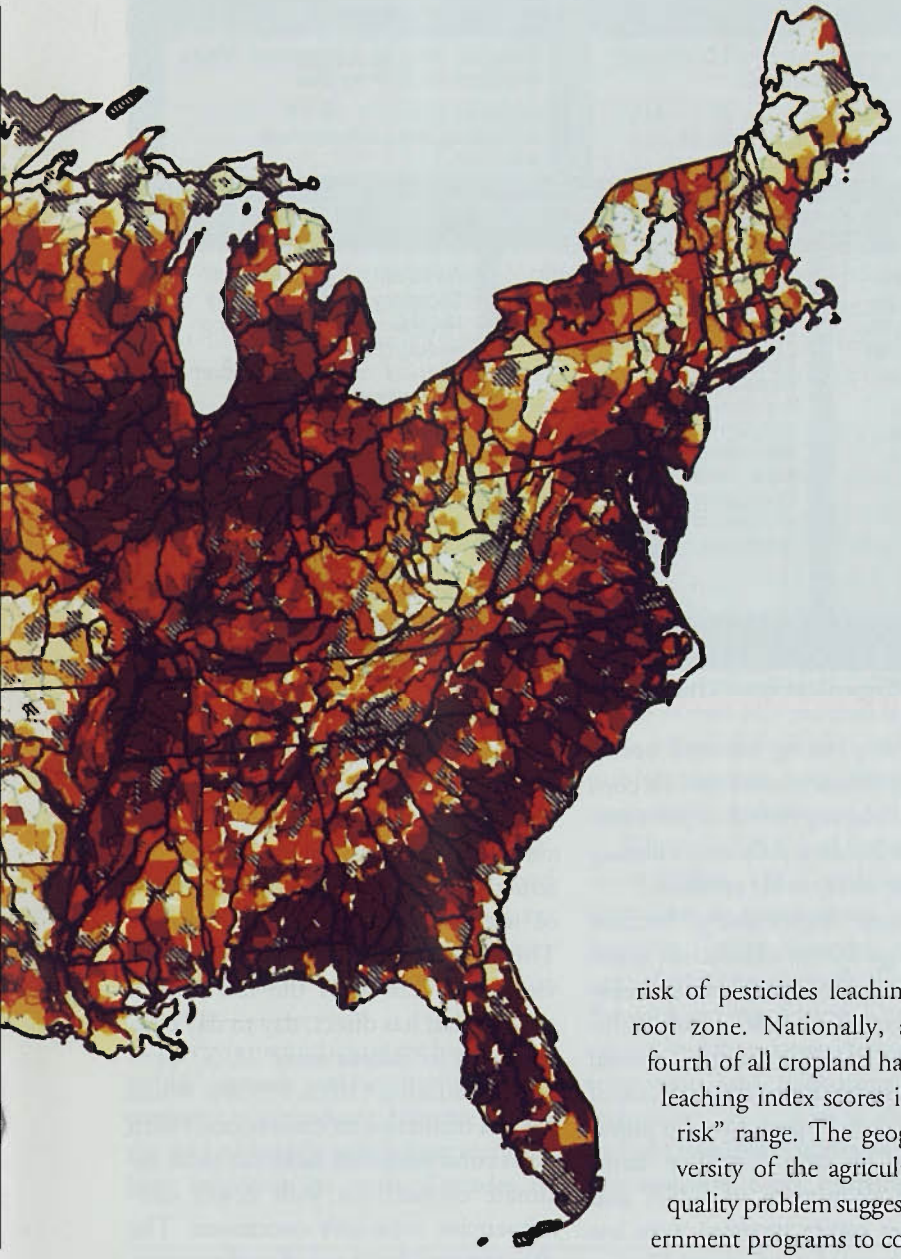

Potential pesticide contamination of groundwater is greatest in the midwest, coastal plains of the south and east, and the irrigated areas of the west, as shown in both the Lee and Nielsen and the NCRI/USDA studies. The NCRI/USDA study further found that, even in the geographic regions of highest pesticide leaching potential, significant acreages showed low risk of pesticides leaching past the root zone. Nationally, about one fourth of all cropland had pesticide leaching index scores in the "low risk" range. The geographic diversity of the agricultural water quality problem suggests that government programs to control nonpoint-source pesticide pollution must be flexible to avoid unnecessarily penalizing producers in low-risk situations.

Researchers developed the pesticide leaching index as part of the USDA Water Quality Initiative launched in 1989. The Initiative provides for research and programs to show the location and severity of agricultural contamination of groundwater supplies, to develop new and modified farming systems to reduce chemical loadings leaving crop fields, and to stimulate adoption of the new and modified farming systems. A surface water analog to this map is currently in development. Together they will be used in the debate on the upcoming reauthorization of the Clean Water Act and the 1995 farm bill.

Researchers developed the pesticide leaching index from information about the chemical leaching properties of different pesticides, leaching characteristics of different soils, rainfall, and chemical applications by crop. Geographic information for soils, rainfall, and chemical use by crop came primarily from two data bases: the 1982 National Resource Inventory, which shows land use and other site specific land characteristics, and the Resources For the Future data bases of herbicide, insecticide, and fungicide use by crop area for years 1987–91. The map base was created by overlaying boundaries of 3,041 counties, 189 Major Land Resource Areas as defined by the USDA, and 2,111 Hydrologic Units as defined by the U.S. Water Resources Council.

The map was developed to identify broad spatial trends using a consistent national-level data base. Consequently, interpretations at a local level (a single county, for example) may be misleading.

■ For more information

on the methods, data, and findings of the study, see *Agricultural Chemical Use and Groundwater Quality: Where are the Potential Problem Areas?*, by Robert L. Kellogg, Margaret Stewart Maizel, and Don W. Goss, published by the Soil Conservation Service, USDA, Washington D.C., December 1992. For a copy of this report, write to Robert Kellogg, Resources Inventory and Geographic Information Division, Soil Conservation Service, P.O. Box 2890, Washington D.C., 20013.