PATRIOT

Model Uses   PATRIOT provides for the simulation of pesticide movement in unsaturated soil systems within and immediately below the plant root zone.

Major Categories Water Quality	**Subject Knowledge Level** Intermediate
Minor Categories Pesticides	**Technical Difficulty Level** Intermediate
Model Type Physical Model	**Geographic in Nature?** No

Abstract

Pesticide Assessment Tool for Rating Investigations of Transport (PATRIOT) provides rapid analyses of ground water vulnerability to pesticides on a regional, state, or local level. PATRIOT assesses ground water vulnerability by quantifying pesticide leaching potential in terms of pesticide mass transported to the water table. It integrates a tool that enables analysis of pesticide leaching potential with data required for area-specific analysis anywhere in the U.S.

PATRIOT is composed of five separate sub-models and routines that assist in the modeling of pesticides, processing of data and provide easy to follow user interfaces.

Future Developments
Unknown

Model Limitations
Requires high level of knowledge of hydrogeology and numerical modeling concepts.

Model Features

- A pesticide fate and transport model (PRZM2),
- A comprehensive database,
- An interface that facilitates database exploration,
- A directed sequence of interactions that guide the user in providing necessary information to perform alternative model analyses, and
- User-selected methods for summarizing and visualizing results.

Required Data Types

Ground water vulnerability assessments for a specific geographic area requires data on the influx of water and pesticide, soils properties and distribution, pesticide chemodynamics, agricultural practices, and the distance from the soil surface to ground water.

PATRIOT includes databases that satisfy rainfall (10 years of daily rainfall from primary NOAA weather stations), soils properties and occurrence (NRI/SOILS5 linked database (9)), pesticide properties (SCS/ARS/CES Pesticide Properties Database (10)), and cropping practices (EPA cropping practices database (11)). Pesticide-crop relationships and depth to water table estimates must be supplied by the user.

Model Outputs

PATRIOT outputs graphic comparisons of the leaching potential for various combinations of pesticide, soil, rainfall, and agricultural practices. Output options allow reporting of either unit or area-weighted leaching analyses aggregated within geographic boundaries. For a selected period of analyses, either average annual or total leaching can be reported. In addition, PATRIOT enables the viewing of many intermediate tables, maps, and graphics that support the user and help them to understand the impact of decisions in site characterization. A supplemental feature of the model is the ability to perform Monte Carlo simulations for evaluating the effect of uncertainty in pesticide and soil properties on pesticide transport.

Hardware Requirements
Standard DOS requirements

Supported Platforms			
DOS	☒	**UNIX**	☐

Software Requirements
None noted.

Cost, Licensing and Availability
DAFLOW is provided free of charge from the link below. Users are expected to be State personnel charged with developing pesticide management plans as well as other regulatory and resource management institutions.

Source
US Environmental Protection Agency

Source URL
http://www.epa.gov/ceampubl/gwater/patriot/