Metadata

Originator: Monica McFadden

Publication Date: 2020

Title: High-Resolution Pesticide and Fertilizer Quantification on a Web-Based System

Abstract:

> This visualization provides tools for analysis of spatial and temporal trends for pesticide application across Iowa, 1992-2018. The visualization was compiled from USGS county-by-county pesticide use estimates. Data were downloaded from the USGS National Water-Quality Assessment (NAWQA) Project website, cleaned and organized, then uploaded to Tableau proprietary software which was used to perform the visualization.

Purpose:

> The purpose of this visualization is to advance scientific visualization of agrochemical use in Iowa in order to gain new insight into spatial and temporal trends that are not evident in the data's current format.

Time Period of Content: 1987-2020

Project Status: Complete

Spatial Domain: State of Iowa

Data Source: USGS Pesticide National Synthesis Project

> Originator: Nancy T. Baker
> Publication Date: 2017
> Title:Estimated Annual Agricultural Pesticide Use by Crop Group for States of the Conterminous United States, 1992-2015
> Online linkage:https://water.usgs.gov/nawqa/
> Type of Source Media: Tabular Digital Data
> Time Period of Content: 1992-2016
> Source Contribution: Epest_Low and Epest_high pesticide data for Iowa on a county-by-county basis, organized by year.
> Data Processing: Data were cleaned to only include Iowa counties. Tables were appended to create a single data file with all data for Iowa counties for the years 1992-2016.

> Note: 2017 and 2018 data were later released, and data file was updated.

Data Source: EPA CompTox Chemistry Dashboard

> Originator: Antony Williams
> Publication Date:2017
> Title: The EPA CompTox Chemistry Dashboard: A Web-Based Data Integration Hub for Toxicology Data
> Online linkage: https://comptox.epa.gov/dashboard/about
> Type of Source Media: Tabular Digital Data
> Time Period of Content: N/A

Source Contribution: Chemical and toxicological data for pesticide compounds
Data Processing: Data were downloaded in bulk from the CompTox database and cleaned in Microsoft Excel to ensure database character compatibility prior to database upload.

Data Source: EPA Integrated Risk Information System (IRIS) Database

Originator: Abdel Kadry
Publication Date: 2014
Title: Integrated Risk Information System
Online linkage: https://edg.epa.gov/metadata/
Type of Source Media: Tabular Digital Data
Time Period of Content: N/A
Source Contribution: Electronic reports on specific substances found in the environment and their potential to cause human health effects
Data Processing: IRIS supplied toxicological data on each pesticide compound involved in this study.

Entity Type: Epest_Low

Entity Type Definition: USGS-calculated estimates of annual state-level pesticide use by crop group. When pesticide use was not reported for a particular pesticide-crop combination within a crop reporting district, a value of "0" was estimated for pesticide use.
Entity Type Source: U.S. Geological Survey

Entity Type: Epest_High

Entity Type Definition: USGS-calculated estimates of annual state-level pesticide use by crop group. When pesticide use was not reported for a particular pesticide-crop combination within a crop reporting district, nearby crop reporting district estimates were used to interpolate the data and develop an estimate.
Entity Type Source: U.S. Geological Survey

Attribute: Compound

Attribute Definition: Common name for pesticide compound active ingredients
Attribute Domain Values: Pesticide ingredients for which use estimates were made

Attribute: Year

Attribute Definition: Calendar year for which fertilizer or pesticide was used
Attribute Domain Values: Estimated pesticide loading years range from 1992-2018.

Attribute: FIPS Code

Attribute Definition: A standard six-digit identifier for each county in the U.S.
Attribute Domain Values: County Federal Information Processing Standard County Code (https://www.census.gov/geo/reference/codes/cou.html)

Attribute: State

Attribute Definition: State name
Attribute Domain Values: Iowa

Spatial Data Organization: Federal Information Processing System (FIPS) county location codes

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Data Parameter Descriptions

Average Mass: The average weighted mass (grams) of molecular isotopes for one mol of the compound.

IRIS: URL for the CompTox summary of EPA Integrated Risk Information System (IRIS) Database data. The IRIS program identifies and characterizes human health hazards of anthropogenic chemicals and publishes toxicologic data in the IRIS database.

Octanol Air Partition Coefficient: The Kaw is the ratio of a chemical's concentration in the gaseous phase to its concentration in the aqueous phase of a two-phase air/water system. It is an important parameter when investigating the tendency of a particle to volatilize in the environment.

Octanol Water Partition Coefficient: The Kow is the ratio of a chemical's concentration in the octanol phase to its concentration in the aqueous phase of a two-phase octanol/water system. It can be used as a proxy for the tendency of a chemical to partition between an organic phase (e.g. the fat of a fish, soil, etc.) and the aqueous phase. The values given here are the Log(Kow), which is typical for this parameter. The values are unitless.

SMILES: The Simplified Molecular-Input Line-Entry System (SMILES) is a specification in form of a line notation describing the structure of a chemical species using short ASCII strings.

Soil Adsorption Coefficient: The Kd is a measure of a compound's propensity to partition between soil and water. This is particularly important for understanding how readily a compound such as a pesticide will run off from fields into surface water.