PANNA Water & Pesticides Information Center (WaterPIC)

Pesticide Action Network North America (PANNA)
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Introduction to WaterPIC

• Why We Need a WaterPIC
  – Released: November, 2005

• Background
  – PUR, surface water monitoring, TMDLs

• WaterPIC Demonstration

• Potential Study Areas
The Problem: In A Nutshell
Problems: Using Available Data Sets

- Very large
- Scattered: not under one roof
- Different formats
- Idiosyncratic data
- Specialized software and skills to do spatial analysis required
- TIME CONSUMING!!!!
Background: PUR
Reported Agricultural Pesticide Use in California, 2002
Total Pounds of Active Ingredient Applied per Square Mile

2002 Pesticide Use
lbs / square mile
0 - 2,000
2,001 - 10,000
10,001 - 50,000
50,001 - 120,000+

Data Sources:
ESRI Data
CA DPR Pesticide Use Report 2002
Public Land Survey, DPR 1999
Produced with
ESRI ArcView 9.0
www.MapItOut.com

California
USEPA Region 9: Percent of Impaired Waters, 1998
Background: Major Pollutants in California

1. Sediments
2. Nutrients
3. Pathogens
4. Pesticides
5. Toxics: Inorganics ( Metals )
6. Toxics: Organics
7. Mercury
Background: USGS Monitoring Data
Background: Department of Pesticide Regulation (DPR) Monitoring Data
Background: Total Maximum Daily Loads (TMDL)

• Address non-point source pollution such as agricultural pesticide runoff
• Set limits on pesticide concentrations that show up in water from a given watershed
• Will result in regulation of pesticide runoff
• WaterPIC designed to help in the process
WaterPIC Objectives

• Harmonize datasets under one roof

• Accelerate analysis of pesticides impacts on the environment including use trends

• Facilitate a greater understanding of relationships between pesticide use and environmental impacts in water

• Create an easy to use and easy to understand tool for regulators, scientists, watershed groups, and the general public
Hypothetical Users

• Molly the Policy Maker
  – Regulators, legislators, policy analysts
• Brad the Mad Scientist
  – Scientists and researchers at academic institutions, regulatory agencies, etc.
• John Q. Public
  – The general public, growers, public interest groups, etc.
WaterPIC Datasets

- DPR Pesticide Use Reporting (PUR) data
- Surface water quality monitoring data
  - USGS
  - DPR
- Geospatial information
  - RWQCB TMDL watershed delineations
  - CalWater 2.2.1 watershed delineations
  - USGS HUC watersheds delineations
  - PUR’s modified Public Land Survey (PLS)
- Aquatic toxicity
  - EPA AQUIRE data
Welcome to the WaterPIC

The Water & Pesticides Information Center (WaterPIC) provides information about the relationships between reported, agricultural pesticide use in California and measured surface water concentrations in the environment. Follow the steps below to study this relationship over the area and time of interest.

Step 1 of 5: Please select a regional watershed from the map or click a link below:

Search by one of the following watershed delineations:
- Calwater defined
- RWQCB defined TMDL
- USGS defined hydrologic unit code (HUC)

Your selections so far:
1. Watershed: Not specified
2. Study Area: Not specified
3. Time Period: Not specified
4. Pesticide: Not specified

Help files regarding:
- Step 1: Watersheds and other geographic information

Citation: A. Chey, Philip D. Keigley, B. Hill, and S. Orme, PAM Pesticide Database, Pesticide Action Network, North America (San Francisco, CA, 2006),
http://www.pesticidesinfo.org
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Disclaimer
Step 2 of 5: Select a Calwater watershed:

Hydrologic Unit: COLUSA BASIN

Hydrologic Area: Glenn Colusa

Select Hydrologic Area: Butte Basin

Select Hydrologic Subarea First

Select Hydrologic Super Planning Watershed First

Submit  Reset

West Sacramento River Watershed

Size: 8,072,752 acres (32,669 km²)

Total pounds of pesticides active ingredients used in the West Sacramento River Watershed in 2003: 17,382,472 lbs (7,901,124 kg)

More pesticide use information at www.pesticideinfo.org

California Regional Water Quality Control Boards:
Central Valley Sacramento Main Office - Region 5
11020 Sun Center Drive #200
Rancho Cordova, California 95670-5114
Phone: (916) 464-4646
Fax: (916) 464-4646

Central Valley RWQCB Redding Branch Office - Region 5
415 Kneelorest Drive, Suite 100
Redding, California 96002
Phone: (530) 224-4840
Fax: (530) 224-4857

Help files regarding:
Step 2
Calwater watersheds

Pesticide use and other agricultural information for counties in the West Sacramento River Watershed:
Step 2 of 5: Select a RWQCB-defined TMDL watershed:

Select a TMDL watershed
- Sacramento River
- American River
- Butte-Sutter Basin
- Colusa Drain
- Feather River
- Natomas Cross Canal Area
- Sacramento River Above Colusa

Sacramento River Watershed

Site: 3,322,000 acres (~13,440 km²)

Total pounds of pesticides active ingredients used in the West Sacramento River Watershed in 2003:
- 12,899,769 lb (5,822,016 kg)

More pesticide use information at www.pesticideinfo.org

California Regional Water Quality Control Board:
- Central Valley Sacramento Office - Region 5
  11020 Sun Center Drive #200
  Rancho Cordova, California 95670-6114
  Phone: (916) 454-4381
  Fax: (916) 454-4546

- Central Valley RWQCB Redding Branch Office - Region 5
  431 Knoles Drive, Suite 100
  Redding, California 96002
  Phone: (530) 224-4845
  Fax: (530) 224-4847

Pesticide use and other agricultural information for counties in the West Sacramento River Watershed:

- Butte
- Colusa
- El Dorado
- Glenn
- Placer
- Sacramento
- Shasta
- Sutter
- Tehama
- Yolo
- Yuba


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Step 2 of 5: Select a USGS defined HUC watershed:

Select Hydrologic Unit Code (HUC) [Submit]

Help files regarding:
Step 2
HUC watersheds

Your selections so far:
1. Watershed: West Sacramento River
2. Study Area: Not specified
3. Time Period: Not specified
4. Pesticide: Not specified
### Step 4 of 5: Select a pesticide to study:

Note: *Urban pesticide uses* are not included in the WaterPIC.

<table>
<thead>
<tr>
<th>Pesticide</th>
<th>Chemical Class</th>
<th>Total Pounds of Active Ingredients</th>
<th>Number of Pesticide Applications</th>
<th>Number of DPR Surface Water Samples</th>
<th>Number of USGS Surface Water Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper sulfate (pentahydrate)</td>
<td>Inorganic-Copper</td>
<td>1,504,487</td>
<td>2,034</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td>Inorganic</td>
<td>979,615</td>
<td>1,629</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propamid</td>
<td>Anilide</td>
<td>941,826</td>
<td>3,652</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mineral oil</td>
<td>Petroleum derivative</td>
<td>395,222</td>
<td>1,133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiodicarb</td>
<td>Thiocarbamate</td>
<td>393,607</td>
<td>1,586</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moletope</td>
<td>Thiocarbamate</td>
<td>337,690</td>
<td>1,381</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glyphosate, isopropylamine salt</td>
<td>Phosphonoglycin</td>
<td>190,284</td>
<td>4,596</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metam-sodium</td>
<td>Dithiocarbamate</td>
<td>141,502</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petroleum oil, undclassified</td>
<td>Petroleum derivative</td>
<td>124,271</td>
<td>139</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ziram</td>
<td>Dithiocarbamate</td>
<td>121,423</td>
<td>364</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimethoate - Identification, toxicity, use, water pollution potential, ecological toxicity and regulatory information

Note: See Working with the Information on this Page section below for important notes about this data.

- Chemical ID: Identifying information, including synonyms, ID numbers, use type, chemical classification, a link to a list of all products containing this chemical and a list of the top crops this pesticide is used on in California.
- Poisoning Symptoms: Signs and symptoms of poisoning, first aid, and links to treatment information for this chemical.
- Toxicity: Toxicity to humans, including carcinogenicity, reproductive and developmental toxicity, neurotoxicity, and acute toxicity.
- Regulatory: Links to world-wide registration status as well as regulatory information for the U.S. and California.
- Water: Water quality standards and physical properties affecting water contamination potential.
- Ecotoxicity: Toxicity to aquatic organisms.
- Related Chems: List of chemicals in the same family, including breakdown products, salts, esters, isomers, and other derivatives.

### Chemical Identification and Use for Dimethoate

#### Basic Identification Information About This Chemical

- **Chemical Name:** Dimethoate
- **CAS Number:** 60-51-5
- **U.S. EPA PC Code:** 035001
- **CA DPR Chem Code:** 216
- **Molecular Weight:** 229.2800
- **Molecular Structure:** ![Chemical Structure Image]
The PAN Pesticides Database is your one-stop location for current toxicity and regulatory information for pesticides. To find out more about insecticides, herbicides and other pesticides select one of the choices below. To learn more about our comprehensive collection of data sources see About the Data. This resource is a project of Pesticide Action Network North America.

April 8, 2005: Version 6.0 of PesticideInfo is now live and ready to serve you. Most data sets have been updated and some new features added. Check out What's New!

→ Help Getting Started
→ Chemical Search or Alphabetized Chemical List
→ Product Search
→ Pesticide Poisoning Diagnostic Tool
→ International Pesticide Registration
→ Aquatic Ecotoxicity
→ California Pesticide Use
→ Water & Pesticides Information Center (Beta)
→ Pesticide Tutorial and Reference
→ Least/Non-Toxic Alternatives
→ Links to Other Resources
→ Get Active!

This project made possible by our Sponsors. We need your support. Please consider making a donation today.

NOTE: While all care has been taken to ensure that the information in the PAN Pesticide Database is as accurate as possible at the time of preparation, Pesticide Action Network and its funders take no responsibility for any errors or omissions in the original data sources or for data sources that may have changed since incorporation into the database. The information in this database does not in any way replace or supersede the information on the pesticide product labeling or other regulatory.
Notes:
1. For an explanation of what data is included in this graph please see the WaterPIC printing help file.
2. Please keep in mind that points (squares and triangles) shown above may represent more than one surface water sample.
3. Urban pesticide use are not included in the WaterPIC
4. Resp. Limit = Reporting limit cited by study authors above which analytes were not detected. This number is typically the lowest concentration detectable for a given analyte, analytical method, and analyst.

Replot the graph above using the following water quality criteria: **R.19999981**

### Organism group | Species Common Name | Species Latin name* | Average LC50 or LC95 Concentration Range | Number of Studies
--- | --- | --- | --- | ---
Mollusks | Common bay mussel | *Mytilus edulis* | 3.0 | 1
Mollusks | Calm | *Corbicula leova* | 4.2 | 1
Mollusks | Oriental mystery snail | *Chunogastrellus chinensis* | 4.2 | 1
Phytoplankton | Green algae | *Scenedesmus acutus* | 5.0-9.0 | 2
Phytoplankton | Algae, algal mat | *Algae* | 10 | 3
Phytoplankton | Green algae | *Selenastrum capricornutum* | 10-39 | 5
Fish | Fathead minnow | *Pimephales promelas* | 28 | 5
Fish | Longnose sunfish | *Lepomis megalotis* | 29 | 5
Fish | Sturgeon family | *Asteriscus* | 50 | 1
Insects | Midge | *Chironomus plumosus* | 28-75 | 10
Insects | Mayfly | *Hexagenia bilineata* | 28-75 | 10
Step 5 of 5: View your results:

California Pesticide Use and Surface Water Concentrations for Thiofanecarb in the COLUSA BASIN->Glenn Colusa Watershed.

Your selections so far:
1. Watershed: West Sacramento River
2. Study Area: COLUSA BASIN->Glenn Colusa
3. Time Period: January 1, 2002 to December 31, 2003
4. Pesticide: Thiofanecarb

Help files regarding:
Step 5
DPR and USGS data dictionary
EcoToxicity Dataset (AQUIRE)

Download text files for:
DPR Monitoring Data
USGS Monitoring Data
Pesticide Use Reporting Data
(Right-click "Save as" or "Download Linked File...")
WaterPIC Potential Uses

• Development of water monitoring programs
• First approximation correlation tool
• Provide temporal trend analysis
• Facilitate TMDL development
• Help growers evaluate BMPs (Ag Waiver)
• Find data gaps
WaterPIC Uses: In A Nutshell
WaterPIC Summary

- PANNA recognized a need for a Water & Pesticides Information Center
- The WaterPIC integrates pesticide use, monitoring, and toxicity data in one site
- Fast, free, easy to use from any internet connection
- Can be used to study temporal and spatial correlations between pesticide applications and environmental impacts
- Answers all your pesticide questions can be found at www.pesticideinfo.org
Acknowledgements

– Funders: USEPA Region 9, True North Foundation, San Francisco Foundation

– Stephen Orme, Susan Kegley PhD, Brian Hill PhD

– USEPA, DPR, USGS, RWQCB: data source providers
If we have time 1
If we have time 2
If we have time 3
If we have time GIS 1 - San Joaquin Hydrologic Region
If we have time GIS 2 - San Joaquin Hydrologic Region Detail

Red: USGS
Green: DPR
If we have time GIS 3 - Salton Sea Centroid Problem
WaterPIC 1.2 - Technology

- Affiliates
- Regulators
- Researchers
- Community Groups
- Polluters

www.pesticideinfo.org
Apache/Tomcat(JSP) Internet Server using PHP and JPGRAPH

MySQL
14 Databases

BASH UPLOAD SCRIPTS

FileMaker Database

USEPA Acquire

CA Dept. Pesticide Regulation
Pesticide Use Reporting (PUR)

PANNA Databases

World Health Orgnization ICSC Cards

Other Sources