

Proper pesticide use helps protect

# WYOMING GROUNDWATER

Information indicates well water most affected by urban pesticide use

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**W**ould you be surprised to find out more than 30 different pesticides have been detected in Wyoming's groundwater?

Is it shocking to know urban areas are a source of many of the detections?

Would it be a relief to know pesticide concentrations were significantly less than the EPA's safe drinking-water standards?

In today's world, someone may take this information and make accusations and point fingers for the sake of finding blame and those responsible.

Before jumping to conclusions, let's explore the facts and what this information means.

Synthetic pesticides have been used in Wyoming since they were developed in the 1940s as a means to control weeds, insects, and fungus. The science during that time did not understand potential risks to

either human health or the environment. Some of these pesticides were able to move into surface water and groundwater or otherwise persist in the environment. Since that time scientists have worked to produce new products or product formulations with beneficial uses as pesticides, while striving to better protect people and the environment from adverse effects.

What is the current situation of pesticides in Wyoming's water?

In 1991, the state of Wyoming created the Groundwater and Pesticide Strategy Committee in response to the Environmental Protection Agency's (EPA) "Pesticides and Groundwater Strategy," which describes a federal-state partnership approach to address potential risks to groundwater by pesticides.

The Wyoming committee consists of local, state, and federal government representatives, along with industry and interest groups. This committee prepared the state of Wyoming's State Management Plan, which outlines the individuals and organizations involved, groundwater contamination prevention,

groundwater monitoring, and required responses to detected pesticides in groundwater.

This group meets annually to review previous years' sampling data and determine sampling locations for the upcoming year.

## Getting a Baseline

There was little information available on the occurrence of pesticides in Wyoming's groundwater when the committee created the plan.

From 1995 to 2006, a statewide baseline groundwater assessment project collected and analyzed samples for pesticides from 296 wells in Wyoming.

Of these pesticides, 74 percent were classified as herbicides, with the pesticide atrazine the most frequently detected herbicide. Atrazine is a highly water soluble pesticide used to prevent pre- and post-emergence broadleaf weeds in crops such as corn, and on turf, such as golf courses and residential lawns.

The only pesticide detected across the whole state was prometon, a herbicide for annual and perennial broad-leaf weed, brush, and



## See for yourself and get more information

To see the Wyoming groundwater data described in this article, logon to <http://bit.ly/wyowatermonitor>. For more information on the management of pesticides, please contact your local University of Wyoming Extension office or use the following resources. For simple instructions on how to calibrate a sprayer, contact your local extension office and ask about the 1/128th method of calibration.

- Basic guide to weeds and herbicides  
<http://bit.ly/wyoweedpesticide>
- Insects and related pests of trees, shrubs and lawns  
<http://bit.ly/wyoinsectpests>
- Pests of the home vegetable garden  
<http://bit.ly/wyogardenpests>
- Wyoming Pesticide Applicator Core Manual  
<http://bit.ly/wyoapplicator>
- Wyoming Pesticide Safety Education website  
<http://uwyoextension.org/psep/>

grass control mainly in non-cropping situations, such as gravel driveways, fences, and along roads, and is persistent in the environment.

An intriguing, but intuitive, conclusion became evident. Pesticide detections occur more frequently in wells in areas where there are more people and more activities using pesticides. The baseline sampling described pesticide detections in relation to the geographic area and the land use (agriculture, urban, undeveloped, and mixed) surrounding the well.

The areas of the state with the most cities and most agriculture had the largest number of different pesticides detected. Pesticides were detected more frequently from wells in urban areas than wells in agricultural or mixed areas.

### Resampling Shows Little Change in Concentrations

In 2008 to 2010, a resampling study of 52 wells looked for previously detected and new pesticides. Because previous pesticide detections were related to specific areas and land use, resampling focused on the areas that had the largest number of different pesticides, but include all areas of the state.

During this resampling study, 28 different pesticides were identified with 95 percent classified as herbicides or herbicide degradates (the compound that remains when a herbicide breaks down).

Of the 28 pesticides, 13 were the same as in the baseline study, and 15 pesticides were new. Most pesticides had little change between the concentration of the pesticides found

in the baseline study and resampling study wells.

### What Does This Mean?

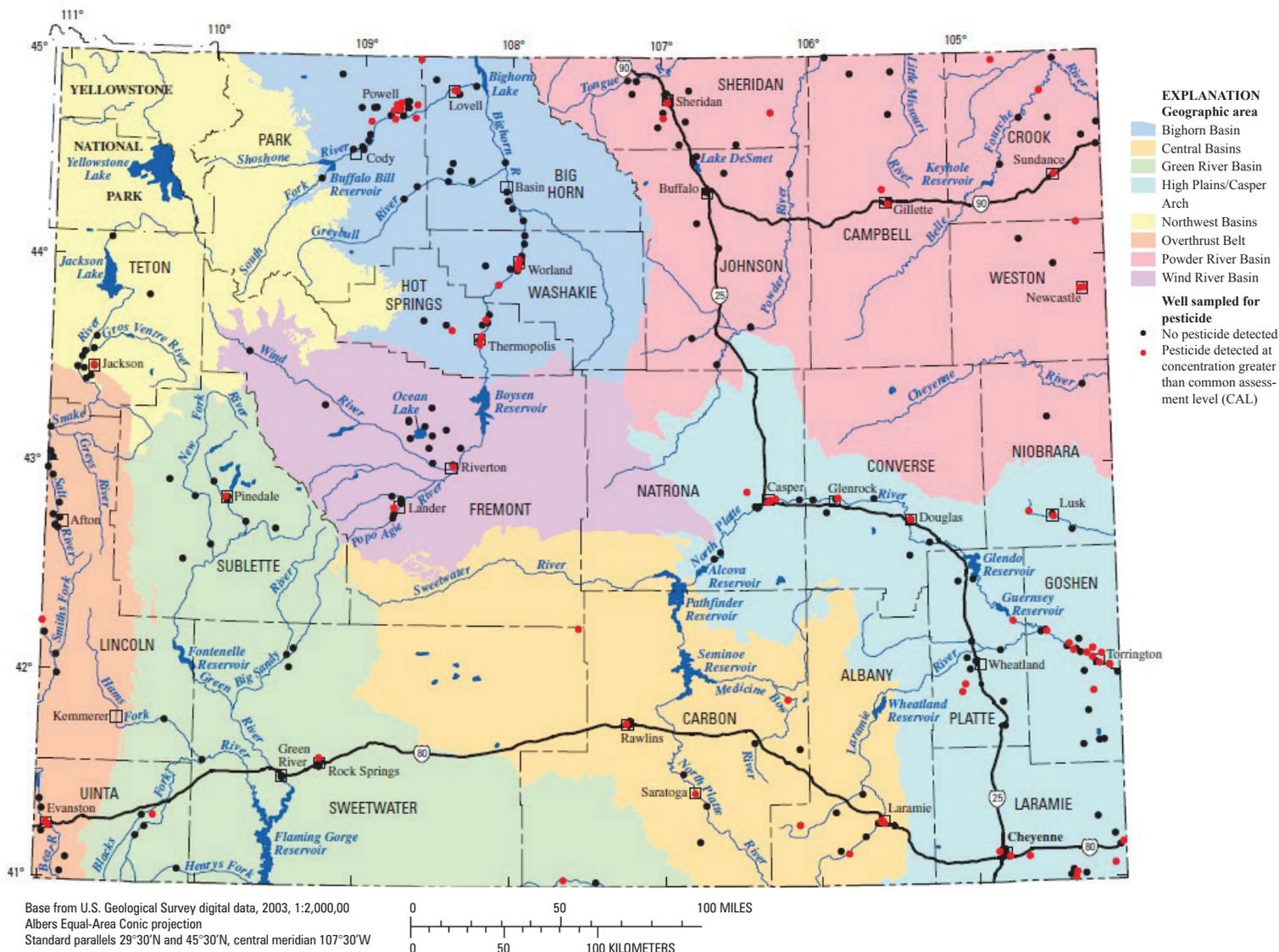
Herbicides are the most common pesticides detected in our groundwater. The areas in the state with the most prevalent detection of pesticides in groundwater are the Bighorn Basin and High Plains/Casper Arch areas. It also shows wells in urban areas frequently contain low concentrations of pesticides, with wells tested in rural or concentrated farming operations having fewer detections.

One very important finding of these studies is that all detected pesticide concentrations were significantly less than what the EPA has established for safe drinking-water standards. This is great news in terms of Wyoming's public health. Because of past and current pesticide use, while no pesticides in water would be desirable, it would not be reasonable to expect. The good news is that out of over 600 samples collected, pesticides were never detected above a drinking water standard.

The reality is everyone who uses pesticides is responsible for keeping pesticides out of groundwater. This includes all of us living in an urban space (within town, subdivisions, or ranchettes). No matter if applying 1 gallon or hundreds of gallons, we all need to be responsible users of pesticides (whether herbicides, insecticides, or another class of pesticide).

What does it mean to be a responsible user of pesticides?

1. Make sure to correctly identify the pest (weed, insect, disease) prior to managing. Proper identification determines effective control options.



2. Determine the most effective and economical control option(s) for the situation. Many times pests can be controlled without pesticides. This prevents wasting time and money on poor or non-effective control options.
  3. If using pesticides, select the correct pesticide for the pest that needs controlled by reading the label. This guarantees the product will control the identified pest.
  4. Correctly calibrate your sprayer prior to spraying. This prevents over or under use of a pesticide, which leads to water pollution or poor control of pests.
  5. Read and understand the label! Apply the recommended rate. Using more than the labeled rate is illegal and is not more effective.  
 Never apply pesticides before a rainstorm or before watering. The pesticide will be washed off or infiltrate into the ground if adequate time is not allowed to dry or be absorbed, contaminating water and resulting in little pest control. Applications should always be during calm weather to guarantee pesticides are applied to the target area.
- Only through proper handling, application, storage, and disposal of pesticides will we be able to decrease the groundwater contamination and strive to eliminate it.

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