Protecting Groundwater from Pesticide Contamination

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Presentation Outline

- Some basic facts about pesticides
- Brief history of pesticide groundwater pollution
- Legislation mandates for DPR
- Recent changes to legislation

California Department of Pesticide Regulation (DPR)

Mission Statement:

To protect human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management.

What is a Pesticide?

Pesticide: any substance intended to control, destroy, repel, or otherwise mitigate a pest.

Pest: an organism that causes damage or economic loss or transmits or produces disease.

Obvious Categories of Regulated Pesticides

- Herbicides
- Insecticides
- Fungicides
- Nematicides
- Miticides

Not-so Obvious Categories of Regulated Pesticides

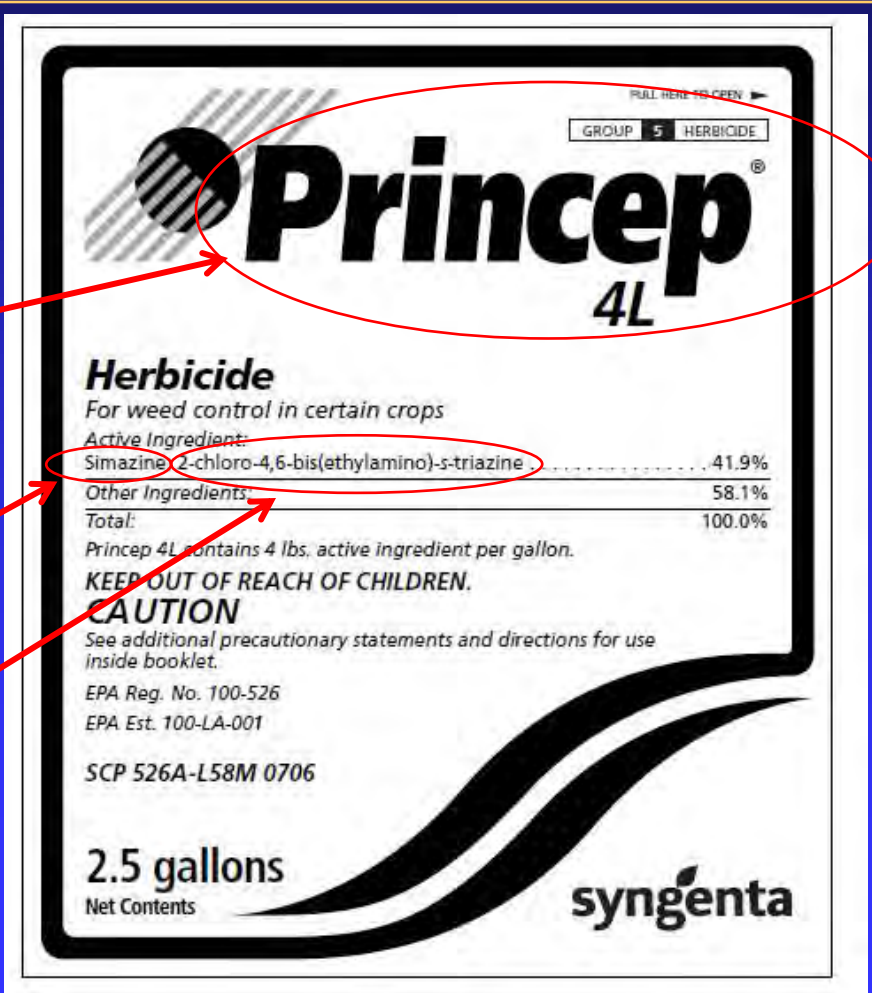
- Adjuvants
- Biopesticides
- Defoliants
- Desiccants
- Disinfectants
- Insect & plant growth regulators
- Pheromones
- Repellents
- Wood preservatives

Pesticide Products = Active + Inert Ingredients

trade name

common name

chemical name



Pesticide Products vs. Ingredients

>1,000 registered active ingredients

>13,000 registered pesticide products

Pesticide Sales vs. Reported use

- 550 to 850 million pounds sold annually
- 150 to 200 million pounds sold that require reported use

Brief History of Pesticide Pollution of California Groundwater

Stanford Research Institute (1972)

"Most data collected imply that the incidence of pesticides in groundwater is low and not a significant environmental contamination factor."

Brief History of Pesticide Pollution of California Groundwater

DBCP – soil fumigant that controls nematodes

1977: health effects of DBCP reported

1979: DBCP found in wells at plant

1979-84: sampling expanded statewide

Investigation Findings

- DBCP in 2,449 wells statewide
- 57 different pesticides
- 22 pesticides from non-point ag use

AB 2021 - Pesticide Contamination Prevention Act (1985)

- Purpose: to prevent further pollution of groundwater due to agricultural use of pesticides

- Six major mandates

#1: Collect Environmental Fate Data

Measures of pesticide mobility:

- Water solubility
- Soil adsorption coefficient (Koc)

#1: Collect Environmental Fate Data

Measures of pesticide persistence:

- Hydrolysis half-life
- Aerobic soil metabolism half-life
- Anaerobic soil metabolism half-life
- Field dissipation half-life

dpr

#2: Identify Potential Groundwater Contaminants

Specific Numerical Values – threshold values of mobility and persistence properties

Ground Water Protection List - 3 CCR 6800(b)

#3: Monitor Pesticides on Ground Water Protection List

- 98 active ingredients on the list

Domestic

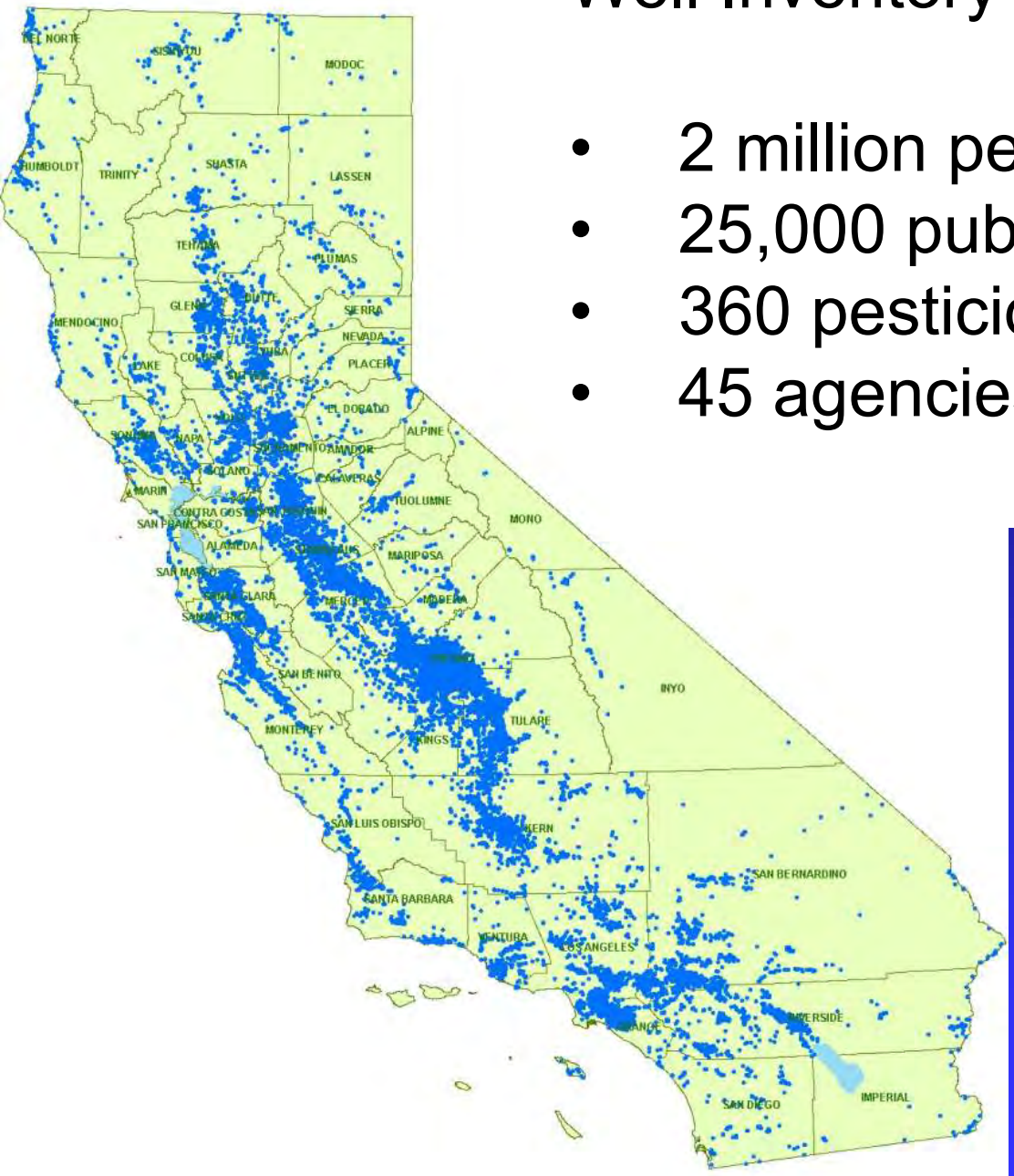
Agricultural

Public

#4: Collect Monitoring Data from Other Public Agencies

- Legal agricultural use?
- Non-point or point source pollution?
- DPR performs follow-up monitoring

Well Inventory Database:



- 2 million pesticide samples
- 25,000 public/private wells
- 360 pesticides/degradates
- 45 agencies

#5: Formal Review of Detected Pesticides

- Measured pesticide concentration > 0.05 ppb
- Pesticide submitted to *Detection Response Process*

- Four potential outcomes:

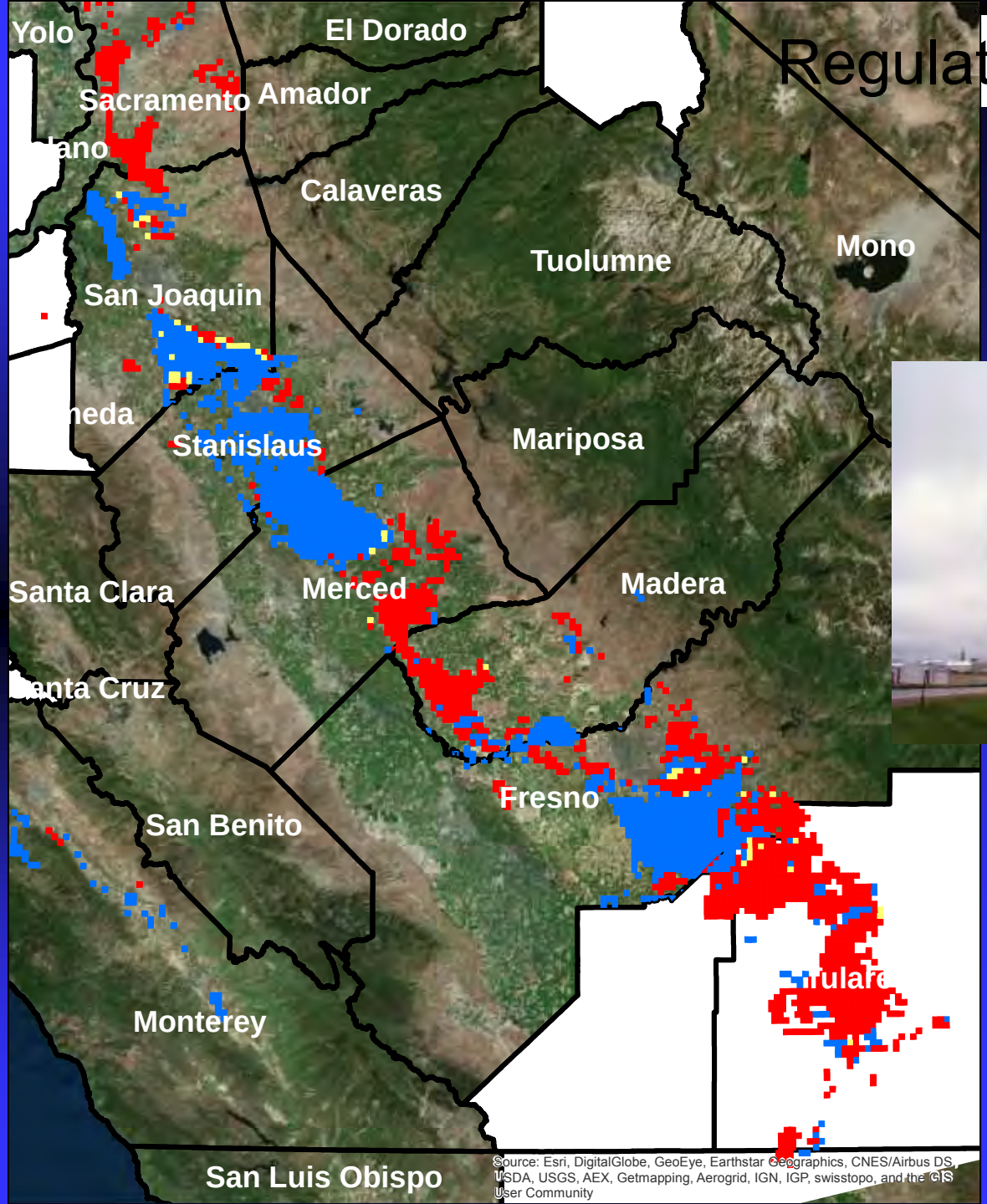
1. Cancel registration
2. Does not pollute
3. Restrict use to areas
4. Regulate use in areas

#6: Adopt Regulations to Modify Use

Restricted Use Pesticides: 3 CCR Section 6800(a)

1. Atrazine
2. Simazine
3. Bromacil
4. Diuron
5. Prometon
6. Bentazon
7. Norflurazon

Regulated Use Areas



Pesticide Contamination Prevention Act Revision (2014)

Two important changes:

1. Revise *Specific Numerical Values*
2. Regulate pesticides due to detection of their degradation products